THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT
November 20, 1989 · Vol. XXIII · No. 47 · 144 Pages · $2/Copy · $48/Year

COMPUTERWORLD

INSIDE

Executive Report — How well ISDN works depends on what you want to do with it. Page 85.

In Depth — Becoming an IS mentor. Page 99.

Profile: Amid the glamour of Universal Studios, George Brenner directs the successful IS script for MCA's entertainment empire. Page 77.

First delivery is still a year away, but DEC's announcement of a commercial version of its Enterprise Management Architecture platform hit the streets last week. Page 6.

The glory days of being a start-up are dead. More on that and other news from Comdex/Fall '89. Pages 136, 137.

Five CIOs shared top honors last week, receiving awards for achievements in managing information technology. Page 135.

The Jolly Green Giant has canned a crop of minicomputers in favor of a PC local-area network. Page 63.

Data General CEO Edson de Castro is handing over day-to-day executive duties at the long-suffering minicomputer maker. Page 14.

Soviet bloc faces skills drain

BY AMIEL KORNEL
CW STAFF

Sobering realities await the revelers celebrating the lifting of the Iron Curtain. When the euphoria of newfound freedom subsides, Eastern Europeans may find that the people they need most to help build their future have packed their bags and headed West.

The flood of emigrants flowing through breaches battered in the once-impervious divide could leave Eastern Europe drained of computer specialists vital to its economic recovery. Their exodus is likely to worsen the already dire situation facing information systems specialists who choose to remain.

At VEB Robotron, East Germany's largest computer and electronics group, company spokesman Dietmar Otto estimated that more than 800 of the state-owned company's 68,000 employees have already emigrated. He described those who left as "skilled workers."

The ranks of those departing are likely to grow. "Most technical people will go abroad if possible and try to stay," predicted Sasha Barilov, software developer at the Soviet Academy of Science's Leningrad Institute of Informatics, while attending Comdex/Fall '89 in Las Vegas last week. "Most engineers are not satisfied with their jobs and know they could make much more money in the West."

Eastern European excitement over the recent easing of travel restrictions in Hungary and Poland peaked Nov. 9, when East Germany announced that its citizens could travel freely to West Berlin. An estimated 300,000 of the country's 17 million people have chosen to emigrate since the borders opened. Czechoslovakia and

Continued on page 135

IBM, Microsoft pave over OS/2 rifts

BY PATRICIA KEEFE
and CHARLES VON SIMSON
CW STAFF

LAS VEGAS — IBM and Microsoft Corp. joined hands last week in a carefully crafted show of unity that was aimed at turning around the sluggish sales performance of the OS/2 operating system.

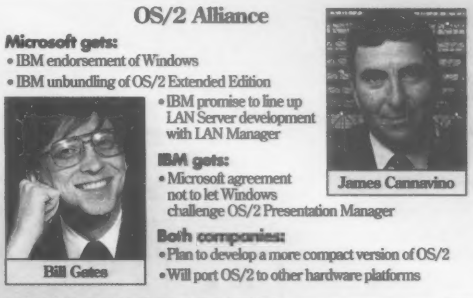
In an announcement that should allay user fears but also infuriated some key developers (see story page 136), the two companies agreed to address user resistance to the operating system's size. They also moved to isolate Windows as a low-end system that will quickly fall behind Presentation Manager, OS/2's graphical component.

OS/2's progress has been stymied by user concerns over differences between IBM's and Microsoft's versions and the increasingly vicious bickering among software developers over encroachment by the MS-DOS-based Windows interface on sales of Presentation Manager.

For users, the final results of last week's announcement should turn out to be a less expensive migration path, fewer worries about incompatible versions of OS/2 and more freedom to mix and match components from multiple vendors on OS/2 networks.

"The announcement simply puts Microsoft and IBM far

Continued on page 136


OS/2 Alliance
Microsoft gets:
• IBM endorsement of Windows
• IBM unbundling of OS/2 Extended Edition
• IBM promise to line up LAN Server development with LAN Manager
IBM gets:
• Microsoft agreement not to let Windows challenge OS/2 Presentation Manager
Both companies:
• Plan to develop a more compact version of OS/2
• Will port OS/2 to other hardware platforms
Bill Gates
James Cannavino
BILL GATES PHOTO: ANDY FREEBERG. JAMES CANNAVINO PHOTO: JOHN MARTINI
CW CHART

Forgiving disk users order big

Capacity, delivery plan win back 3390 prospects

BY ROSEMARY HAMILTON
CW STAFF

IBM showed the industry last week that it knows plenty about damage control.

The company rolled out its delayed high-end disk drive, the 3390, with enough whiz-bang features to make it top dog when it comes to large system drives. But it was the promise of immediate delivery and a detailed discussion of what went wrong that won back the hearts of users.

When IBM canceled the 3390 announcement last July and did not explain why, it was on the verge of kissing millions of dollars in revenue goodbye. Users, many of whom were in dire need of more direct-access storage device capacity, felt they had been left hanging, and some said they were angry enough to go to other vendors.

By the end of last week, however, IBM had a salesman's dream on its hands. Customers wanted to buy and buy big.

Take Jack Cooper, president of CSX Technology, Inc., the information systems division of CSX Corp. Just a few months ago, Cooper was ready to do business with an IBM competitor if IBM did not resolve the 3390 problem fast. Last week he

Continued on page 8

Bay Area transit officials suffer $40M IS headache

BY J. A. SAVAGE
CW STAFF

SAN FRANCISCO — A system to replace the Bay Area Rapid Transit's 20-year-old CPUs and software has been labeled a failure by BART officials, even though the software vendor involved in the test called it an "unqualified success" after testing earlier this month.

The Integrated Control System, which is to be used for routing and tracking BART trains, has met with approval from BART's own information systems staff, but external audits said it cannot handle the volume of trains needed, and it is also massively over budget.

"Maybe under perfect conditions with no passengers at 3 a.m., it could handle [the requisite] 74 trains," said Arlo Hale Smith, president of the BART board of directors.

The controversy has increased since the Oct. 17 earthquake, when BART became the transportation of necessity around the fallen Bay Bridge.

The new system cost $40 million — $27 million over budget. Roughly half the cost went to early system prototyping and "unsuccessful starts," according to Jim Steiner, BART's manager for the project. The software company, Logica Data Architects, Inc., based in Waltham, Mass., has been paid about $20 million. Logica won the bid for the project in the mid-1980s.

A financial audit recently completed by Peat Marwick Main & Co. found the software company had overcharged the transit system by $2 million, according to Smith. A technical

Continued on page 134

NEWSPAPER
#630**********5-DIGIT 48106
#UIU7ZE300M039058# 0010109485
UNIVERSITY MICROFILMS INT 0542
UNIVERSITY MICROFILMS INT
SERIAL PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48106
SECOND CLASS

IN THIS ISSUE

NEWS

4 Lotus flowers on the factory floor with @Factory.

4 Going graphic with Lotus' 1-2-3/G spreadsheet.

6 DEC fogs network management atmosphere with cloudy rollout plan.

8 IBM takes the cake with explanation of disk-drive glitch.

10 Unix players map new game plans as terrain shifts.

14 Short-term Memory loss: More firms decline membership in semiconductor consortium.

14 Data General chooses a new CEO to shore up the financial dikes.

15 Licentious behavior: Critics fear that granting Israel export licenses for supercomputers might brew trouble.

135 Strategic IS users honored by American Management Systems and Carnegie-Mellon University.

136 Asp-er: Some venomous comments for developers from Ashton-Tate's chairman.

137 A chilly reception awaits start-ups dipping a toe in industry waters.

Quotable

"I've been in this business 30 years, so I'm nervous about everything they do. But if they've told us they've solved it, I have a high degree of confidence that they have."

DAVID MOORE
MELLON BANK

On the technical problems with IBM's 3390 disk drive. See story page 1.

SYSTEMS & SOFTWARE

31 Update problems from RDMSs looking for commitment.

35 3M walks the leading edge, using a cautious approach as balance.

PCs & WORKSTATIONS

51 Florida Steel shows its 'mettle' by considering networked PCs in place of minis.

NETWORKING

63 Green Giant cuts the Bull and turns Blue.

MANAGER'S JOURNAL

77 Industry CIOs ain't misbehavin', but they sure get around.

COMPUTER INDUSTRY

111 Foreign objects: Oracle views overseas markets through rose-colored financial projections.

EXECUTIVE REPORT

85 Companies that have worked with it in test mode view ISDN with cautious optimism.

IN DEPTH

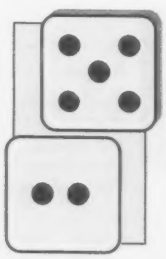
99 Guiding the careers of others can help your staff, your company . . . and yourself. By Kate Nasser.

DEPARTMENTS

6 News Shorts
22 Editorial
84 Calendar
117 Computer Careers
126 Marketplace
132 Training
134 Stocks
138 Trends

UPDATE

Performance interruptus. Getting a little bored with the same routine after several years of marriage — to your job, that is? If this describes your situation, you're not alone. According to a recent study by recruitment specialists Robert Half, about one-third of the executives who remain in the same job for up to five years experience 'a decline in energy, creativity and performance.' After a few more years at the same job, the number of bored workers rises to about 50%. Half's chairman suggests that executives find innovative ways to re-energize themselves. Geritol, anyone? How about some cheesecake? Or maybe some beefcake?



ISDN is still a game of chance, but those who have taken a shot say they'll keep trying. Page 85.

ERIC FERSONLACESTAR

LAN-based personal computers will mean dollar savings and performance gains for Florida Steel. Page 51.

EXECUTIVE BRIEFING

■ **Better late than never.** IBM rolled out its ballyhooed 3390 disk drive — and explained the technical glitch that has delayed the high-end DASD product since July. The problem was a new lubricant that caused chemical imbalance on the disk; IBM went back to the future and replaced the new substance with the lubricant used in older 3380 Model K drives. Users appear satisfied that the problem has been rectified but nonetheless plan their own shakedown cruise for a few months by using 3390s in noncritical environments. **Pages 1 and 8.**

■ **Users are still taking a wait-and-see approach to ISDN.** Several trials have been successful, but only in limited applications. Proponents contend that it offers real advantages such as higher speeds and greater bandwidths, but others say there's nothing ISDN can do that clever users can't dc already via alternative means. It is likely to be quite a while before data-oriented users actually see anything like cross-country connectivity. **Page 85.**

■ **Citicorp's pioneering use of ATMs,** Levi Strauss' retail network and Chrysler's computerized service diagnostic system were among the winners at the American Management Systems/Carnegie-Mellon awards for IS achievement. The third annual awards also honored IS work in state government, universities and the military. **Page 135.**

■ **The East German rush to freedom** through the raised Iron Curtain may have a significant downside — the emigration of the Eastern Bloc's best technical talent. As these heady days of celebration end, Eastern European government and business leaders will have to turn their attention to laying a technological foundation on which to rebuild. **Page 1.**

■ **Thirty-five percent of top IS executives** expect to change jobs in the next two years, according to a recent survey. A significant 21% said they are not happy with the IS structure or policy in their current organization. **Page 77.**

■ **A $40 million systems overhaul** has been derailed by San Francisco's Bay Area Rapid Transit system authorities. The new software, which was originally intended to replace 20-year-old Westinghouse CPUs with Data General minicomputers, is $27 million over budget and was labeled "a complete failure" by one BART board member. **Page 1.**

■ **The storybook days** of the garage or basement computer start-up company may be over, said attendees at last week's Comdex/Fall '89. A crowded market and short-term investor thinking have put the brakes on small companies' chances of making it big on their own. Today's start-ups are concentrating on enhancements to existing standard products — essentially serving as an R&D arm for the larger vendors. **Page 137.**

■ **On-site this week:** Even the Jolly Green Giant has succumbed to downsizing. Pillsbury's Green Giant subsidiary has moved its core management applications from Honeywell DPS 6 minicomputers to IBM Personal System/2s on a local-area network. **Page 63.** Downsizing is also the order of the day at Florida Steel in Tampa, where 18 DEC PDP-11/73s may wind up on the scrap heap in favor of networked 80386-based PCs. Systems managers expect the change to make its production software run 15 to 30 times faster. **Page 51.** At 3M in St. Paul, Minn., the fine line between the leading edge and the bleeding edge of new technology is critical. Director of Technology Chuck Anastasi is charged with maintaining the balance between central technology standards and innovation in 3M's 50 business units. **Page 35.**

SYNCSORT PRESENTS 3 NEW WAYS TO MAKE SHORT WORK OF LONG JOBS.

A major reason your long jobs get that way is because of sorting. In fact, sorting may be using up to 35% of your resources.

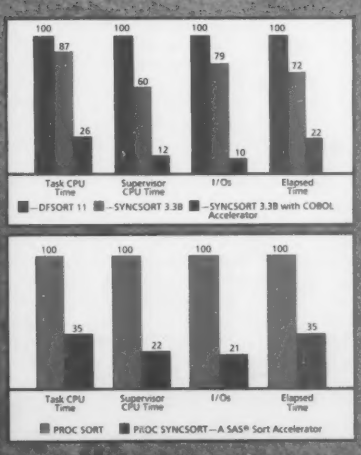
We think that's too much. Inefficient sorting costs you more than time. It costs you money. And plenty of it. Many of the resources you presently devote to sorting could be freed up for profitable new applications or improved response time. Costly hardware upgrades could be delayed or avoided.

INTRODUCING 3 NEW RESOURCE SAVING SORT PRODUCTS

Each designed to cut sorts down to size, and increase the productivity of your entire data processing operation.

SyncSort/COBOL Accelerator. Cuts your COBOL sort time up to 75% without changing your COBOL programs.

PROC SYNCSORT. This SAS® sort accelerator will pay for itself in months. In fact, PROC SYNCSORT will reduce your elapsed sort time up to 66%.



Online SyncSort. Only Online SyncSort lets you use pre-defined record layouts, eliminates syntax errors, automatically optimizes the use of system resources, and provides unmatched output capabilities. The impact on programming time and system resources is substantial.

FREE NO-RISK TRIAL

Each product comes with a free trial period. See for yourself just how much time, and money, SyncSort will save you.

To arrange for your free trial, call us today. With SyncSort, you'll make short work of all your jobs.

syncsort INC.

50 Tice Boulevard, Woodcliff Lake, NJ 07675

800-535-3355

Lotus takes to the factory floor

Firm teams up with General Motors to enter the manufacturing sector

BY ELISABETH HORWITT
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. is expected to enter the manufacturing sector this week with software designed to collect factory-floor data, analyze it and display it in real time using its popular 1-2-3 interface.

Co-developed with and co-funded by General Motors Corp., Lotus' @Factory is said to provide live connections between cells within a Lotus 1-2-3 spreadsheet and the cell controllers and computers that monitor factory-floor devices.

"So you can have a spreadsheet sitting there and updating how many red, blue and green cars were painted over the first, second and third shift," said Nick Losole, Lotus' market development manager for manufacturing.

GM has been beta-testing @Factory for the last six months and began implementing the system in real manufacturing environments during the last couple of months, according to Michael Kaminski, manager of GM's Manufacturing Automation Protocol (MAP) program. Pilot applications collect data from the plant floor for analysis by a range of plant personnel, from superintendents up to managers, he added.

For example, the auto maker has developed a "nice quality reporting system that ties Lotus to applications collecting quality data and displaying it quickly in a meaningful format for people who use that data," Kaminski said.

The current version of @Factory includes a device driver to the MAP 3.0 networking standard. Lotus 1-2-3's move to MAP could finally convince users to start implementing the networking standard, according to Cambridge, Mass.-based Advanced Manufacturing Research, Inc.

MAP has suffered from sluggish demand until now, primarily because users have viewed it as a technology that lacks useful applications, AMR Vice-President Bruce Richardson said.

"It's [difficult] selling MAP networks if you can't demonstrate why users would want them," he said.

As an "enabler" that allows users and shop-floor vendors to develop tailored applications using familiar commands and graphics, Lotus 1-2-3 with @Factory could fill a major void in the manufacturing sector, Richardson said.

Darcor Casters, Inc. was one company that expressed interest in the prototype of @Factory that Lotus demonstrated at the recent Autofact '89 conference in Detroit. "We use Lotus in the office for accounting and engineering, and we have it hooked up to testing [applications]," said Darcor plant engineer Adrian Steenson.

A direct link between Lotus and shop-floor devices would allow managers to use the familiar spreadsheet software to analyze cycles and other production data, he added.

In addition to collecting data from the shop floor for local analysis, @Factory allows Lotus spreadsheets to exchange information with host databases via the MAP Manufacturing Messaging Service protocol, Losole said.

Lotus also plans to provide its Datalens tool kit for developing "hot links" that support two-way automatic updating between its spreadsheets and host databases, he added.

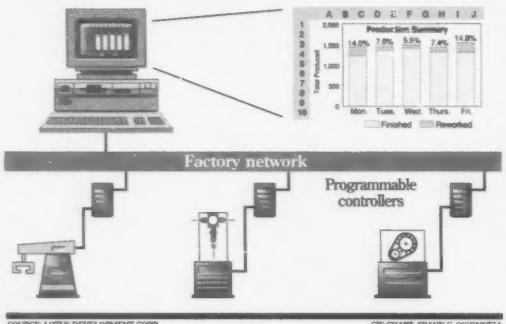
For example, changes to a master build schedule, which often resides on an IBM host, would automatically update scheduling and production requirements across various areas on a plant supervisor's spreadsheet.

Conversely, a spreadsheet that tracks the number of defective parts produced in a given period for a particular department would automatically update a quality control database, which often resides on a Digital Equipment Corp. Microvax, Losole said.

In addition, @Factory will include an interface that will allow support for other communications protocols, including the proprietary links used by popular controller vendors such as Allen-Bradley Co.

Hitting the factory floor

Lotus' @Factory can update a spreadsheet on-line by using data collected from programmable manufacturing devices



SOURCE: LOTUS DEVELOPMENT CORP. CW CHART: FRANK C. O'CONNELL

Supporting role

However, it will be up to users, systems integrators and value-added resellers to provide that support, Losole said. Shop-floor vendors such as Square D Co. and Burr Brown Corp. have already developed their own add-ins that allow Lotus to collect data from their proprietary devices.

Lotus will initially sell @Factory through integrators and value-added resellers, but it will set up its own direct sales force in the future if demand warrants it, Losole said. The company will also announce its first three distribution partnerships with Concord Communications, Inc., Computrol, Inc. and Systems Integration Specialists Company, Inc.

Scheduled availability for @Factory is for the first quarter of next year, with no pricing provided as yet.

Busy days for 1-2-3; graphics version in test

BY PATRICIA KEEFE
CW STAFF

LAS VEGAS — Having snubbed Microsoft Corp.'s Windows, Lotus Development Corp. is trying to walk the thin line between preserving user investment in its character-mode 1-2-3 spreadsheet and migrating those same users to a graphical interface operating under OS/2 Presentation Manager.

Last week, Lotus demonstrated its answer to that problem — 1-2-3/G, a graphical version of its popular spreadsheet that recently went into beta testing and should ship in June.

According to Lotus, 1-2-3/G combines well-known Lotus spreadsheet features with a graphical interface that has the power and feel of its DOS-based predecessor.

Highlighted in particular were the keystroke compatibility with 1-2-3 and Solver, a goal-seeking attribute that automates the "what-if" process [CW, Oct. 30]. Other features will include clipboard support, dialog boxes, cascading menus, multiple windowing, hot-links to other worksheets, improved and expanded graphics capabilities, direct access to external databases without using SQL commands and support for OS/2 LAN Manager.

The pricing and availability of 1-2-3/G will be announced later, Lotus said. It will make 1-2-3/G Server and Node editions available 90 to 120 days after it ships.

Partners in products

In addition, Lotus announced a partnership with Wordperfect Corp. designed to ensure a high level of integration and interface consistency between both vendors' core products. Wordperfect also is developing a Presentation Manager version of its namesake word processor.

"[They] are integrating their products to help counter Microsoft's growing strength in applications," said Jeffrey Tartar, publisher of "Soft Letter."

The two companies will work on a user interface compliant with IBM's Common User Access guidelines while also using the Dynamic Data Exchange protocol to foster live data exchange between both applications.

The vendors said they will employ similar menu commands and dialog boxes in their OS/2 applications to enable users to easily learn new conventions common to both products.

Lotus and Wordperfect took the opportunity to needle rival Microsoft Corp., referred to as the "M" company.

By working to provide greater integration between their products under OS/2, based on a similar look and feel, the two companies implied they will be relieved from pressure to enter multiple applications markets, and users will be free to choose the best application that suits a particular need.

"No one today is successfully selling a range of software applications," claimed Pete Peterson, Wordperfect's executive vice-president, in an oblique reference to Microsoft, which produces applications for a variety of markets, including its Excel spreadsheet and Word word processor.

COMPUTERWORLD

Editor in Chief
Bill Laberis
Executive Editor
Paul Gillin
News Editor
Peter Bartolik
Assistant News Editor
James Connolly
Senior Editors
Clinton Wilder, Management
Elisabeth Horwitt, Networking
Patricia Keefe, PCs & Workstations
Michael Alexander, PCs & Workstations
Rosemary Hamilton, Systems
Nell Margolis, Industry
Robert Moran, Software
Senior Writers
Alan J. Ryan
Maryfran Johnson
Joanie M. Wexler
Staff Writer
Richard Pastore
New Products Writer
Sally Cusack
Features Editors
Glenn Rifkin
Joanne Kelleher
Senior Editors
Michael L. Sullivan-Trainor
Amiel Kornel
Joseph Maglitta, In Depth
Mary Grover, Product Spotlight
Senior Writer
David A. Ludlum
Associate Editor
Laura O'Connell
Assistant Researchers
Jodie Naze
Kim Nash
Chief Copy Editor
Donald St. John
Assistant Chief Copy Editor
Joyce Chutchian
Features Copy Editors
Joseph J. Fatton
Cathleen A. Duffy
Copy Editors
Carol Hildebrand
Gary Byrne
Catherine Gagnon
Art Director
Nancy Kowal
Graphics Specialists
Frank C. O'Connell
John B. York
Graphics Researcher
Kevin Burden
Assistant Graphics Researcher
Paulo Costa
Assistant to the Editor in Chief
Linda Gorgone
Editorial Assistants
Lorraine Witzell
Tammy Gryniewicz
Chris Lindquist
Rights and Permissions Manager
Sharon Bryant
News Bureaus
Mid-Atlantic
201/967-1350
Robert Moran, Software Senior Editor
Amy Cortese, Correspondent
Washington, D.C.
202/347-6718
Mitch Betts, Bureau Chief
West Coast
415/347-0555
Jean Bozman, Bureau Chief
J.A. Savage, Senior Correspondent
Charles von Simson, Senior Correspondent
James Daly, Correspondent
Chris Flanagan, Editorial Assistant
Midwest
312/827-4433
Ellis Booker, Correspondent
Computerworld Focus on Integration
Editor
Ann Dooley
Managing Editor
Lory Zottola
Senior Writer
Helen Pike
Art Director
Tom Monahan
IDG News Service
Penny Winn, Director
Main Editorial Office
Box 9171, 375 Cochituate Road
Framingham, MA 01701-9171
508/879-0700
Subscriptions: 800/669-1002

Systems software for MVS data centers:

Enter the world of total resource management, total support.

Computer Associates presents the industry's most extensive, integrated software for systems managed storage environments.

CA-UNIPACK™/SRM
STORAGE AND RESOURCE MANAGEMENT
Consisting of: CA-1® or CA-DYNAM®/TLMS, CA-ASM2®, CA-BLOCKMASTER® CA-SORT® CA-SRAM® and CA-UCANDU®

CA-UNIPACK/SRM completely automates storage and resource management functions in even the most complex data center environments. It provides comprehensive tape and DASD management facilities, sort/merge and file manipulation utilities and comprehensive management reporting.

CA-UNIPACK/SRM optimizes storage utilization, often eliminating the need for costly additional hardware. It ensures data integrity by enforcing installation-defined storage standards and protecting data resources. It increases data center productivity by eliminating labor-intensive, error-prone tasks, freeing up valuable staff, as well as by reducing job elapsed times through faster and more efficient sorting.

Only Computer Associates has the products and expertise to provide this cost-effective, total solution.

And only Computer Associates offers **CA-UNISERVICE®/II**, a secure link between your mainframe and CA's Customer Service System 24 hours a day. You get online access to software fixes, interactive problem resolution, plus product tutorials and more!

Call Dana Williams today:
800-645-3003

© 1989 Computer Associates International, Inc.
711 Stewart Ave., Garden City, NY 11530-4787

COMPUTER ASSOCIATES
Software superior by design

- World's leading independent software company.
- Broad range of integrated business and data processing software for mainframe, mid-range and micro computers.
- Worldwide service and support network of more than 100 offices.

Resource & Operations Management • Financial • Banking • Graphics • Spreadsheets • Project Management

NEWS SHORTS

Amdahl layoffs

Amdahl Corp. announced last Friday it would lay off about 5% of its worldwide work force, or about 400 employees, primarily in the U.S. Amdahl executives have recently complained of their profit margins being squeezed in bidding wars with IBM, although the company's revenue continues to climb. Bob Djurdjevic, president of Annex Research, a Phoenix-based consulting firm, said he did not expect customer support to suffer. The layoffs took effect immediately.

. . . . . .

HP sees results jump . . .

Hewlett-Packard Co. last week reported $3.4 billion in revenue for its fourth quarter ended Oct. 31 — a 25% jump over last year's fourth-quarter figure. Net profits also enjoyed a double-digit rise, up 23% to $386 million. However, the costs of two foundation-shaking events — the May 1989 acquisition of Apollo Computer, Inc. and last month's Bay Area earthquake — toppled net profit to $246 million, only a 1% increase over net earnings for last year's comparable period. HP Chief Executive Officer John Young found the operating figures a treat but said that the company still has a trick or two to learn about managing expense growth.

. . . . . .

. . . then begins reorganization

Meanwhile, HP moved to tighten the integration of its office systems and networking businesses by combining its Information Systems and Information Network Groups under the banner of Information Networks Group and the direction of Robert Frankenburg, former head of Information Systems.

. . . . . .

SEC urges vigilance

The Securities and Exchange Commission (SEC) issued a policy statement last week urging stock exchanges to test their computer systems periodically to identify possible areas of vulnerability. The SEC suggested that exchanges update their capacity estimates and contingency plans, conduct "stress tests" on their systems and report any unauthorized access.

. . . . . .

Account-A-Call to track Rolm action

IBM last week sold its Rolm Analysis Center, which provides call accounting services for users of Rolm CBX private branch exchanges, to Account-A-Call Corp. in Burbank, Calif., makers of the Telephone User Management System. Account-A-Call will assume responsibility for such Rolm phone management services as call tracking, which allows the allocation of charges to appropriate company divisions or departments.

. . . . . .

TI processor wins award

A 32-bit, single-chip CPU that operates at 150 MHz earned Texas Instruments, Inc. the 1989 Outstanding Technical Achievement award last week from the U.S. Defense Advanced Research Projects Agency. The reduced instruction set computing CPU, which TI claims is the world's fastest, was built from gallium arsenide, said to surpass silicon's circuit speed, high-temperature operation and tolerance to radiation.

. . . . . .

Off to show the wizard

IBM last week used Comdex/Fall '89 to debut the Wizard Adapter, an Intel Corp. I860-based application accelerator for the IBM Personal System/2 family. The RISC-based board, designed to speed processing of technical applications, is scheduled to be available by year's end for $7,000.

. . . . . .

MUMPS a RISC at DEC

Digital Equipment Corp. and Intersystems Corp., in Cambridge, Mass., last week announced the availability of a MUMPS-based relational database management system for DEC's RISC-based systems. The Intersystems M/SQL is a DBMS and application generator first introduced for DEC VAX and PDP-11 platforms in 1988.

Users told Decmcc's in the mail

BY ELISABETH HORWITT
CW STAFF

BOSTON — Digital Equipment Corp. tried the patience of its customers and third-party supporters last week by announcing a vague, two-year rollout for a commercial embodiment of its Enterprise Management Architecture platform, moving the first delivery date to the third quarter of next year — six months later than first stated.

Still, if DEC Management Control Center (Decmcc) Director arrives by the new deadline, it could still be the first functional, truly multivendor network management platform to be delivered by a major vendor, said users and vendors who previewed the system.

"The announcement sounds like DEC is starting to solidify the hole in its network management offerings," said Keith Addison, a manager of technology planning at G.D. Searle & Co.

"DEC's platform seems very elegant from an architectural standpoint, providing a lot of flexibility," said John Payne, staff telecommunications analyst at Charles Schwab & Co.

Primarily an IBM shop, Schwab is now seriously looking at Decmcc Director as a potential corporatewide network management system, although it is also considering AT&T's Unified Network Management Architecture and IBM's Netview, he added.

Flexible approach

The Director's software tools and modular approach seem to provide the flexibility Schwab needs to manage the corporatewide network that it is now designing for use in the 1990s, Payne said.

In addition, DEC offers the potential for a truly distributed approach, which allows other vendors' network management systems to cooperate with Decmcc Director either as peers or as subordinates, Payne said. In contrast, both IBM and AT&T favor hierarchical approaches that put their own management systems on top.

Unfortunately, DEC could not provide a definitive time frame for delivering various pieces of the Decmcc puzzle. By third quarter of next year, the vendor has promised to deliver Decmcc Director Version 1.0, a core system that comprises the following:

- An executive for coordinating interactions among the various modules.
- An object-oriented Management Information Repository that contains network management information.
- Access modules by which third-party systems connect to Decmcc through proprietary or standards-based networking protocols.
- Functional modules that provide basic management applications, such as monitoring and configuration, for systems linked in via the access modules.
- Presentation modules that will present management information to the user in windowed, command-line and topological map formats.

Only some of the above modules will be available with Version 1.0; the rest may be rolled out within a two-year time frame, DEC representatives said, refusing to specify which modules would ship when.

DEC also made publicly available its systems reference manual and developers tool kit to allow more third parties to start developing modules for managing their own products via Decmcc Director.

In January, users can expect delivery of DEC's Decmcc Management Station V1.0, a repackaged version of existing Decnet management tools, designed to run on a VMS system under Decwindows.

The product is said to allow users to monitor several network systems concurrently on different windows including IBM's Netview, which is accessed through an IBM 3270 terminal emulation link.

While the initial Management Workstation may not provide full integration of various Decnet management functions, it at least allows the use of "one terminal instead of four," said Frank Paccione, a vice-president of telecommunications at Bankers Trust Co. "We're particularly happy that DEC is incorporating its existing management tools" into Decmcc, he added.

DEC will provide software tools to help users migrate from the Management Station to the Decmcc Director when the latter becomes available, as well as credit for Decnet management applications toward purchasing equivalent functions on the new Decmcc Director, either concurrently with or within months after DEC ships Version 1.0 of the system in the third quarter of next year.

The four vendors were Codex Corp.; Stratacom, Inc.; TSB International, Inc.; and Vitalink Communications Corp. Vitalink and Stratacom also signed an agreement to integrate Stratacom's IPX line of multiplexers with Vitalink's Wide Area Network Manager.

The remaining three original EMA supporters are Timeplex, Inc., Digital Communications Associates, Inc. and Siemens AG.

Six additional vendors announced that they would integrate their products and services with DEC's EMA: Local-area network vendors 3Com Corp. and Chipcom Corp.; global packet-switching service company Infonet Services Corp.; telecommunications system vendors Telwatch, Inc. and Nynex Information Solutions Group; and the European subsidiary of T1 vendor Newbridge Network Corp.

Can they talk?

Paccione and Addison said their companies are planning to implement both EMA and Netview, and they would like some way for the two systems to communicate. "We just want a bridge so that both the DEC and IBM [network manager] know when a link goes down, since DEC and IBM systems may be sharing data over that line," Addison said.

Also last week, four of the seven original EMA partners announced that they would deliver links between their own networking systems and DEC's

Pieces of the puzzle

DEC has divided EMA into segments for applications (functional), multivendor communications (access) and user interface (presentation)

Functional modules	Access modules	Presentation modules
• Control	• Decnet/OSI Phase V	• Command line
• Configuration	• Decnet Phase IV	• Decwindows
• Domain	• TCP/IP	• MAP
• Topology	• Ethernet	
• Alarms	• Bridge	
• Historical data recording	• Terminal server	
• Performance analyzer	• FDDI	
• Fault-diagnostic assistant	• Decmcc strategic vendor	

SOURCE: DIGITAL EQUIPMENT CORP. CW CHART: JOHN YORK

NETWORK DATAMOVER:
THE FIRST REAL BREAKTHROUGH IN FILE TRANSFER.
Move data freely among MVS, VM, VSE, VMS, Tandem and PC environments.
If you've had it with the hassles and hazards of traditional file transfer methods, now's the time to do something about it. With Network DataMover, you can access all your environments at once with a single, easy, proven solution.
NDM® provides a comprehensive answer to the limitations and labor costs of other data transfer methods. It supports direct file-to-file transfers between all major file types and all major operating environments — from IBM® to DEC® mainframe to PC. And it enables you to automate your production activities along with your file transfers.
With Network DataMover at your key installations, file transfer ceases to be a problem and becomes a powerful basis for meeting a broad range of system-wide needs. From disaster recovery and workload balancing to software distribution and electronic data interchange, NDM opens up a world of new options while it safeguards your existing system software investment.
Find out more about the file transfer breakthrough you've been waiting for. Call or write today: Systems Center, Inc., 1800 Alexander Bell Drive, Reston, Virginia 22091.
800-562-7100
703-264-8000
SYSTEMS CENTER
A NEW YORK STOCK EXCHANGE COMPANY

Disk users

FROM PAGE 1

was preparing to place an order in the $16 million to $20 million range.

"There are always difficulties, but the way they've handled it is what builds good partnerships," Cooper said.

Gartner Group, Inc. said IBM expects to ship up to 5,000 units worldwide by the end of 1989 — less than six weeks away. IBM began shipping drives to customers for beta-testing in late August and claims to have installed 100 units by last week. General week gave it a thumbs-up.

"The proof is in the pudding," said Joe Sheehy, director of the bank's data processing services. "We've seen the results, and that's what's important. We've had no problems."

Apparently, IBM is working overtime to assure users that all is well with the 3390. Several users reported private briefings with IBM. The topper came last week, when IBM's Paul Low, president of the General Products Division, gave a detailed account of the 3390's technical glitch and then announced that the new drive was "the most tested and understood product

Generation gap

IBM's new 3390 disk subsystem (foreground) offers price/performance and floor-space advantage over the older 3380 (background)

	3380K	3390
• Data transfer rate	3M byte/sec.	4.2M byte/sec.
• Capacity	7.5G bytes	22.7G bytes
• Average seek time	16 msec	12.5 msec
• Platter size	14 in.	10.8 in.
• Price for 60G bytes of storage	$930,300	$759,000

SOURCE: IBM — CW CHART: JOHN HUBE

availability begins next month.

While a customer could receive a new drive by year's end, shipments will typically occur five to six months after an order is placed, according to William Grabe, an IBM vice-president and assistant general manager of U.S. marketing and services.

Despite the 3390's technical problem, however, Bank of Boston Corp. was willing to beta-test the drive this fall and last that has ever been brought to the marketplace." (See story at right.)

"They took great pains, abnormally great pains, to explain what happened and resolve this," said Jim Cassell, vice-president of large systems service at Gartner Group.

Users seemed to have turned their attention to the new 3390 features such as the 22G-byte capacity and small footprint and said they were anxiously awaiting delivery.

"We'll be in that first-day window of orders," said David Moore, a senior vice-president of information processing at Mellon Bank Corp. in Pittsburgh. "I've been in this business 30 years, so I'm nervous about everything they do. But if they've told us they've solved it, I have a high degree of confidence that they have."

Users also said the fact that a technical glitch occurred at all leaves lingering doubts about the system. Most said they plan to run the 3390s in noncritical environments for a few months before letting them loose in production environments.

For Greg Ehlers, vice-president of information services at Teco Energy Co. in Tampa, Fla., the new drives will allow him to replace 20 older 3380s with four new 3390 units. "For the first time in many moons we're seeing them deliver real price/performance," Ehlers said.

A fly in the raspberry sauce

When it comes to a complex product such as the IBM 3390 disk drive, the technical glitch that caused its delay could have been any number of things. But who would have suspected the raspberry sauce?

In the words of Paul Low, president of IBM's General Products Division, who likened the 3390 disks to a fancy chocolate layer cake, the raspberry sauce — or the disk's lubricant — used in the new drive was causing a change in the chemical balance of the disk that would have eventually resulted in the loss of data.

Low's cake analogy, given last week at the 3390 rollout, was IBM's first public disclosure on what went wrong with this multibillion-dollar product line. It ended months of speculation since IBM revealed in July that the 3390 would be postponed because of technical problems. Last week's announcement left users and analysts feeling comfortable that IBM had finally come clean on the subject.

In an interview with *Computerworld* last week, Low provided a detailed explanation of what went wrong with the 3390 but ended up raising some questions as well. He said the 3390 engineers tried a new lubricant on the disk because it initially appeared to have superior sliding friction. But when asked what the overall benefit of this lubricant would have been, Low said: "It turns out, nothing."

When asked why IBM elected to use it if it had no real advantages, Low said: "I haven't determined why we went to it in the first place."

IBM ended up going back to the lubricant used in the 3380 Model Ks for its new high-end drives.

According to Low, it was only a few short weeks before the scheduled 3390 announcement in July that his team realized something was amiss. As the 3390 was run through its final tests, the team picked up an electronic signal loss from the disk, which indicated something was wrong with the chemical composition.

Without knowing what the problem was or how serious it could be, IBM decided it was best to test the product for all possible flaws, Low said. The abrupt change and subsequent silence on IBM's part sent a wave of anger through the user community.

Low claims that IBM was able to find the flaw and fix it so quickly because the engineering team was working on two 3390s at the same time, as is often the case.

Low said the only difference between the two drives under development was this lubricant on the disk. The drive that was set to be announced used the new lubricant, whereas the other drive used the older lubricant that is used in the 3380 Model K disk drive.

Since there was no signal loss on the 3390 with the old lubricant, it was determined that the new raspberry sauce caused the problem.

In accelerated life tests, the new lubricant was giving off a "gooey, sticky substance" when the read/write head came in contact with the bits of ceramic pieces on the disk, Low explained. Small amounts of that substance stuck to the head. Over time, the substance would harden into microscopic stalagmites. When the head flew over the disk, the stalagmites would wear tiny grooves into the disk. The grooves would eventually kill data on the disk.

ROSEMARY HAMILTON

Graphical Netview here by 1990

BY JOANIE M. WEXLER
CW STAFF

WHITE PLAINS, N.Y. — IBM network management users' faces should light up with their workstation screens when the graphical Netview interface they have been clamoring for ships at the end of the year.

IBM last week announced a Dec. 29 ship date for its Netcenter graphic network monitor, which it purchased from US West Network Systems in July. At the time of the purchase, IBM dropped long-running internal efforts to develop its own Netview interface.

Netcenter teams up with Netview and Netview/PC to control multivendor networks. The mouse-driven, icon-based monitor reportedly allows operators to get either a preformatted view of an IBM Systems Network Architecture (SNA) network or to customize an SNA or multivendor network representation.

A Service Point Interface, which was developed by US West but added to the Netcenter product by IBM, allows Netcenter to receive information about other vendors' equipment through Netview/PC, which collects the network management information from non-IBM devices. Netcenter can then display this information graphically. In addition, if a non-IBM device goes down, according to Helen Morse, IBM's manager for network management product marketing, it can be activated through the Service Point Interface.

Another option, Morse said, is to use the Service Point interface without Netview/PC; however, users would then have to develop their own code to bring the non-IBM information in through a service entry point.

Netview, which is installed on a user's mainframe, gathers information directly from SNA devices and monitors multivendor devices through information supplied by Netview/PC or the Service Point Interface. Without Netview, which can be programmed to automatically take rectifying measures on problems in the network, operators flagging a network problem using Netcenter would have to correct the situation manually.

Netcenter prices range from $43,400 to $71,400 as a one-time charge or from $1,085 to $1,785 for a monthly license charge, depending on System/370 processor type. To run Netcenter, a $5,000 Netcenter Administrative Workstation is required, IBM said.

TI springs OS/2 CASE tool

BY ROBERT MORAN
CW STAFF

Texas Instruments, Inc. kept its promise to its users last week by announcing an OS/2 version of its Information Engineering Facility (IEF), a computer-aided software engineering (CASE) tool that moves applications development from the mainframe to a personal computer.

According to the company, IEF 4.1, which generates code in both Cobol and C, will run under OS/2 Presentation Manager and allow users to design, generate, test and maintain mainframe applications on a PC before merging them at the mainframe for testing and production. Currently, IEF users must continually interact with the mainframe, consuming time and host cycles.

IEF offers integrated planning, analysis and design tools as well as a relational repository called the Central Repository, and a back-end code generator primarily used for generating DB2 applications. As such, its most significant competitor is IEW from Knowledgeware, Inc., which offers a set of tools with a similar heritage.

Analysts consider TI to be a top-tier CASE player. Competition against IEF stiffened when IBM announced its AD/Cycle marketing agreement with Knowledgeware. "The fact that IBM built an agreement with Knowledgeware has had a significant impact against IEF," said Colin White, president of Database Associates, Inc., in Morgan Hill, Calif. He added that TI has had to announce OS/2 support because its competitors have done so, and OS/2 support is required under IBM's Systems Application Architecture.

100 100

Mainframe? No way.

"Fifteen minutes with Oracle Financials, and I knew I'd never be here justifying a mainframe to the board."

Len LeBlanc, *VP and CFO, Cadence*

Cadence Design Systems has emerged as the number-one integrated circuit design-automation company in the world. But rapid growth created complex accounting problems: acquisitions, merging of different accounting systems and decentralization. One simple demonstration showed Cadence that Oracle Financials™ delivers world-class functionality, yet is so easy to learn and use that they'd never have to read the manual.

Fifteen minutes was enough to convince Cadence that Oracle Financials' distributed, multi-processor architecture gave them the only alternative to a mainframe purchase. Now, they just keep adding inexpensive processors as they need them.

Fifteen minutes showed Cadence the same application portability to which both they and Oracle owed their worldwide success. Cadence delivers the same software on cost-effective workstations, and Oracle is the only company that offers application portability. No one else is even trying.

One demonstration was well worth Cadence's time.

It'll be worth yours. Call today to reserve a seat in the next free Oracle Financials seminar and demonstration.

ORACLE®

Call 1-800-ORACLE1, ext. 8178 today.
See how much 15 minutes can be worth.

Oracle Financials™

100 100

1989 ORACLE FINANCIALS SEMINARS

ALABAMA	
Birmingham	Dec 6
ARIZONA	
Scottsdale	Oct 10 Dec 14
CALIFORNIA	
La Jolla	Oct 19 Dec 12
Los Angeles	Oct 17 Dec 7
Newport Beach	Oct 26 Dec 19
Ontario	Oct 3
San Francisco	Oct 26 Dec 14
Santa Clara	Oct 19 Dec 14
COLORADO	
Denver	Oct 19
CONNETICUT	
Stamford	Nov 9
FLORIDA	
Boca Raton	Oct 18
GEORGIA	
Atlanta	Oct 17
Savannah	Nov 2
ILLINOIS	
Chicago	Oct 25 Nov 15
INDIANA	
Indianapolis	Dec 12
KENTUCKY	
Louiseville	Nov 16
LOUISIANA	
New Orleans	Oct 20
MASSACHUSETTS	
Burlington	Dec 14
MICHIGAN	
Bloomfield Hill	Oct 10
Grand Rapids	Oct 12
Lansing	Nov 9
MINNESOTA	
Minneapolis	Nov 7 Dec 5
MISSOURI	
Kansas City	Nov 8
St. Louis	Nov 14
NORTH CAROLINA	
Charlotte	Oct 27
NEBRASKA	
Omaha	Nov 14
NEW JERSEY	
Cherry Hill	Nov 14
Iselin	Oct 10 Nov 29
NEW YORK	
Melville	Nov 16
New York City	Oct 25 Nov 29
Rochester	Dec 12
Syracuse	Oct 18
OHIO	
Beachwood	Dec 13
Columbus	Dec 12
OREGON	
Portland	Nov 9
PENNSYLVANIA	
Philadelphia	Oct 24 Nov 7 Dec 12
Pittsburgh	Dec 14
SOUTH CAROLINA	
Charleston	Oct 26
Greenville	Oct 12
TENNESSEE	
Memphis	Dec 5
TEXAS	
Dallas	Oct 3 Nov 7 Dec 12
Ft. Worth	Oct 16
Houston	Oct 19 Nov 16 Dec 7
UTAH	
Salt Lake City	Oct 30 Dec 14
WASHINGTON	
Seattle	Dec 11

Attn: National Seminar Coordinator
Oracle Corporation
20 Davis Drive
Belmont, California 94002
1-800-ORACLE1, ext. 8178

☐ My business card or letterhead is attached. Please enroll me in the *FREE* Oracle Financials seminar to be held

at: _____

on: _____

COMP.WORLD

OSF seeks daylight in Unix muddle

BY AMY CORTESE
CW STAFF

The Unix market has been called a battlefield and a playing field. Whichever is the case, however, the ground has clearly shifted.

As AT&T takes unprecedented steps to open Unix, and its supporters rally around the latest version of System V, the Open Software Foundation (OSF) struggles to maintain a foothold.

While OSF's future is by no means certain, indications are that, for the time being, it is on solid ground. At a recent meeting, OSF members voiced support for a bold plan to forge ahead with a version of Unix intended to leapfrog AT&T's System V, Release 4. Users contacted last week said they believe that OSF can still play a valuable role.

The niche OSF is attempting to carve out for itself is that of a provider of innovative new technology. To this end, last week it presented a two-part plan for delivering OSF/1 next November and a second version in 1992.

Additionally, OSF's Request for Technology approach to soliciting technology from the industry is expected to produce distributed computing technology and a common format for distributing application software during the next several months.

Under the revised plan, OSF/1 will feature symmetrical multiprocessing capabilities (SMP) and security that meets federal B1 standards. SMP becomes a significant issue in larger scale systems, which are increasingly built on two or more processors.

David Tory, OSF president and chief executive officer, said OSF will maintain compatibility with AT&T's Unix System V, Release 4 and Sun Microsystems, Inc.'s Network File System, but it intends to go beyond what is provided by the AT&T Unix system. OSF claims it is developing a smaller, more modular Unix kernel based on Carnegie-Mellon University's Mach operating technology that can be the base of future upgrades.

OSF members said they support the decision to expand the scope of OSF/1 beyond original plans based on IBM's AIX, but in the meantime, several are contemplating becoming part owners of AT&T's Unix Software Operation.

AT&T has entertained the idea of spinning off its Unix business for several months, but just weeks ago Robert Kavner, president of AT&T Data Systems Group, initiated talks with members of OSF and Unix International on ways of doing that.

Spin-off shares

Speaking at Comdex/Fall '89 last week, Larry Dooling, head of the semi-independent Unix division of AT&T, said his division has developed a prospectus and that it would soon float some kind of limited public offering to investors within the industry.

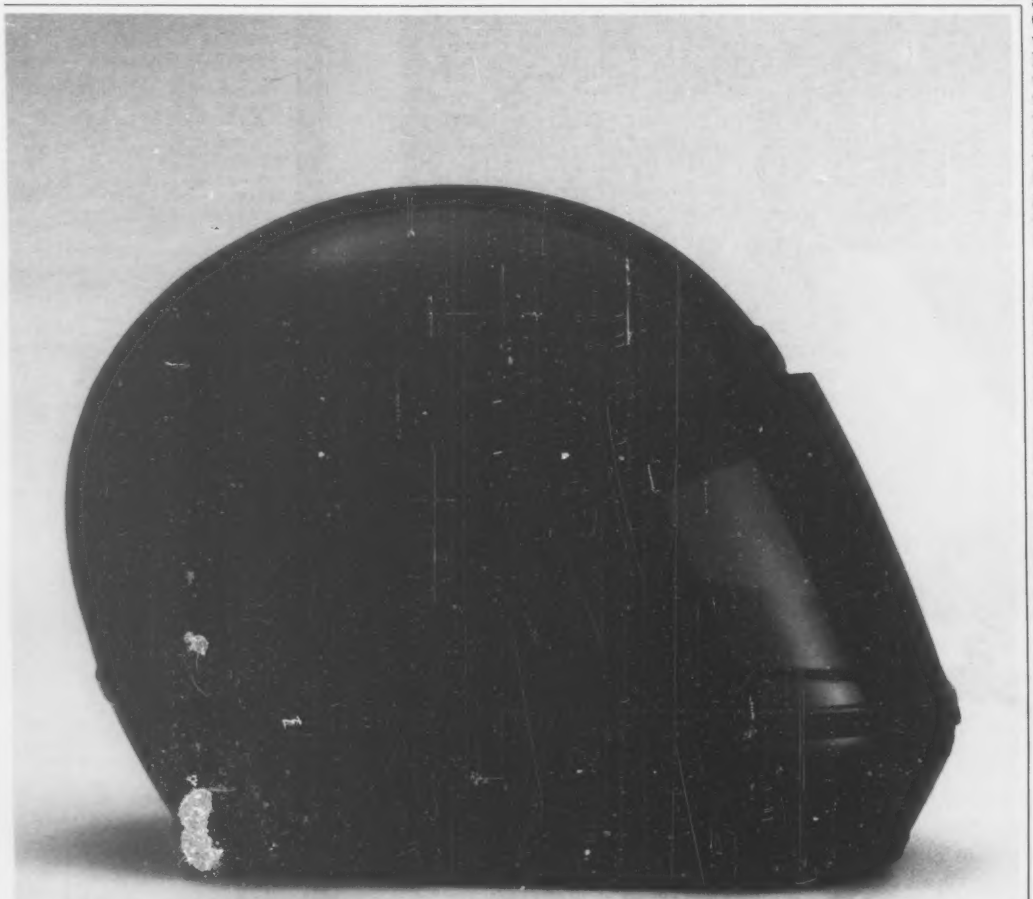
"We will offer shares inside the industry to make sure it is the real spin-off," Dooling said.

In the meantime, Unix users who welcomed System V, Release 4 also see a place for OSF. "I'm glad there is a little competition," said Bill Keatley, director of technology for American Airlines, Inc. "The bottom-line result will be a rich and robust open systems platform for at least the next 20 to 30 years."

Keatley, who uses both System V and AIX, said he found AIX "a little more stable and thorough." He added that the enormous effort IBM invested in cleaning up the Unix kernel will force AT&T to do the same.

Although a publicly owned Unix could resolve many of the issues that led to the creation of OSF, OSF staunchly defends its mission. Danny Wigley, a senior systems consultant for Du Pont Co.'s Fiber Division, agreed. "OSF seems to be much more future-oriented than just coming out with a new release [of Unix]," he said of OSF's efforts to leapfrog AT&T technology.

West Coast senior correspondent Charles von Simson contributed to this report.



Since CA-IDEAL, More Than A Few Programmers Have Been Caught Speeding.

Put your programmers on the fast track, too. With CA-IDEAL® you get a proven, advanced application development system that eliminates tedious coding and allows you to start writing your business applications right away.

In over 1200 MVS, VSE and VM sites worldwide, CA-IDEAL has given programmers significant productivity and quality gains in developing industrial strength applications. It's helped thousands automate everything from basic procedures to complex production systems critical to their operations.

CA-IDEAL works with the world's leading relational data bases: CA-DATACOM/DB and DB2. It includes a powerful procedural language, easy-to-use panel and report creation facilities, and intelligent editor. All of which are fully managed by an active dictionary facility to support the complete application life cycle.

If you want proven speed and performance, call Jamie Brooks right now at 800-237-9273 (in N.J., 201-874-9000) and ask about CA-IDEAL. Then, once you get it, "Gentlemen, start your engines."

COMPUTER ASSOCIATES

© 1989 Computer Associates International, Inc., Route 304 & Orchard Road, CN-5, Princeton, NJ 08543-5063

Find Out Why ORACLE Is Ranked The Number One DBMS. Attend A Free Data Management Conference In Your Area.

CONFERENCE LOCATION _____ CONFERENCE DATE _____

NAME _____

TITLE _____ PHONE _____

COMPANY _____

STREET ADDRESS _____

CITY _____ STATE ___ ZIP _____

HOST COMPUTER(S) _____ OPERATING SYSTEM(S) _____

Your purchasing timeframe (check one):
☐ Up to 3 months ☐ 3 to 6 months ☐ 6 months to 1 year

- Learn about the fully relational DBMS that's compliant with ANSI, IBM SQL.
- Explore the productivity of 4GL & DSS tools.
- See portable applications run across micros, minis & mainframes
- Learn how CASE can end your application backlog.
- Integrate PCs & MACs with MIS.
- See the latest distributed financial applications.

ORACLE®
COMPATIBILITY · PORTABILITY · CONNECTABILITY

Call 1-800-345-DBMS, ext. 8134 today

TO RECEIVE PRIORITY RESERVATIONS AT THE NEXT FREE CONFERENCE.

ORACLE®
Conference Invitation

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 68 BELMONT, CA

POSTAGE WILL BE PAID BY ADDRESSEE:

CONFERENCE COORDINATOR
ORACLE CORPORATION
20 DAVIS DRIVE
BELMONT CA 94002

Now you can use old friends to access corporate data.

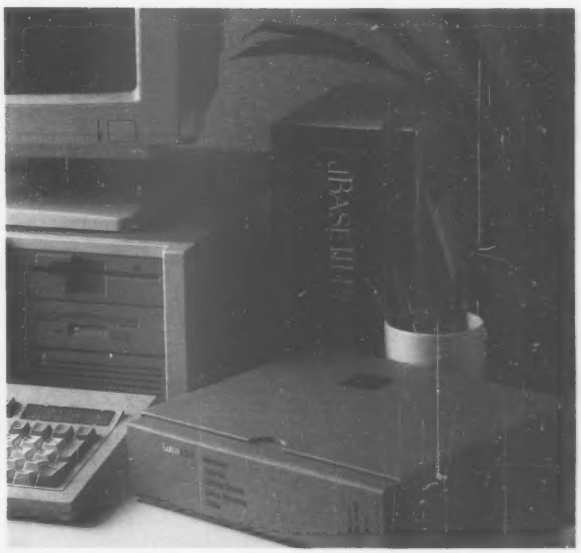
There you are cranking along at your desktop. Then it happens. You realize you need some critical data that resides on your mini or mainframe.

And you can't get it.

Unless of course you've got ORACLE®. For the first time PC and Macintosh users can access ORACLE and IBM® data from any of their favorite desktop applications.

You can query and update data on ORACLE, DB2,™ and SQL/DS databases, using the applications you know and love, including Lotus 1-2-3,® 4th Dimension,® Hypercard,™ Supercard™ and dBASE III Plus.™ Your entire company's wealth of information is available immediately. Without leaving the desktop.

With ORACLE for Macintosh,® you'll be using one of the most popular user interfaces to access corporate data. Give it a test run with the Developer's Version for just $199.



Or, you can have the Full Networking Version for only $999. If you're a 4th Dimension user, consider ORACLE for 4th Dimension, the easiest way to access corporate data through familiar 4D applications. Also $199.

On the PC use ORACLE for 1-2-3 for complete access to SQL databases from your familiar 1-2-3 interface. Or ORACLE dBXL, for giving dBASE III Plus applications access to your ORACLE and DB2 databases. Each for only $299.

Give one of these ORACLE products a try for 30 days. Then, if you're not happy, send them back and we'll send you a full refund.

If you're not ready to give up on your old friends, there's only one thing to do. Call 1-800-ORACLE 1, ext. 8163 now. And enter the computing environment of the 90s.

ORACLE®

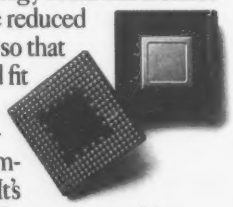
Compatibility • Portability • Connectability

Copyright © 1989 Oracle Corporation. ORACLE is a registered trademark of Oracle Corporation. Macintosh is a registered trademark of Apple Corporation. Hypercard is a registered trademark of Apple Corporation. Supercard is a trademark of Silicon Beach Software Corporation. 4th Dimension is a registered trademark of Acius Corporation. DB2 is a registered trademark of International Business Machines. OS/2 is a registered trademark of Microsoft Corporation. Lotus and 1-2-3 are registered trademarks of Lotus Development Corporation. dBASE is a registered trademark of Ashton-Tate Corporation. dBXL is a registered trademark of Oracle Corporation. Prices valid in U.S. only. ORACLE for Macintosh, $199: Stand-alone version licensed for developers only. Requires Macintosh SE or II with 2MB of RAM, 5MB hard disk space, floppy disk drive, and Hypercard 1.2. Includes 30-day installation support, ORACLE database, Hyper*SQL (HyperCard Interface), SQL*Plus, OCI and Pro*C (Macintosh Programmer's Workshop required for programming usage), System Stacks and Example Stacks. ORACLE for Macintosh, $999: Full networking version is $999 and includes SQL*Net (for database communications) Async, DECnet, TCP/IP support, Alisa System's TSSnet DECnet protocol and drivers and Kinetic's TCPort TCP/IP protocol handler and gateway software for the other machine. ORACLE for 1-2-3, $299: Requires an 80286/80386 running DOS 3.0+ and Lotus release 2.01 or 2.2, 640KB of RAM plus either 1MB of extended memory or the reassignment of 1MB of expanded memory. Connectivity option with networking software starts at $395. dBXL requires a XT PC with 640KB of RAM. Accessing remote systems requires database and networking software on host computer.

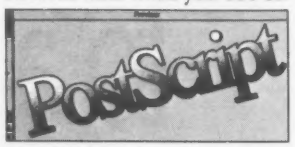
1 The NeXT™ Computer System is the first computer in the world (and so far the only) to use read/write/erasable optical storage. While PCs today are typically equipped with Winchester drives that store 20 to 40 MB, a single optical disk can store 256 MB. Plus, it is removable, for portability and added security. This dramatically new technology provides storage that is simultaneously vast, reliable and cost-effective—a combination unmatched by computers of any size.

2 NeXT has made the power of UNIX® usable by mere mortals. UNIX is the high-performance operating system used by workstations to achieve true multitasking and superior networking. Unfortunately, it has always been the antithesis of user-friendly. NeXT has given UNIX a revolutionary new interface—one that is both visual and intuitive. Now computer users of every level can instantly wield this tremendous power, with no technical knowledge whatsoever.

3 To achieve the power needed for the 90s, NeXT bypassed traditional workstation architecture and went directly to that of a mainframe. This eliminates bottlenecks and attains an extraordinary level of system "throughput"—the true measure of computer performance. Only through the use of VLSI (Very Large Scale Integration) technology could this architecture be reduced in size so that it could fit inside a desktop computer. It's a mainframe on two chips.

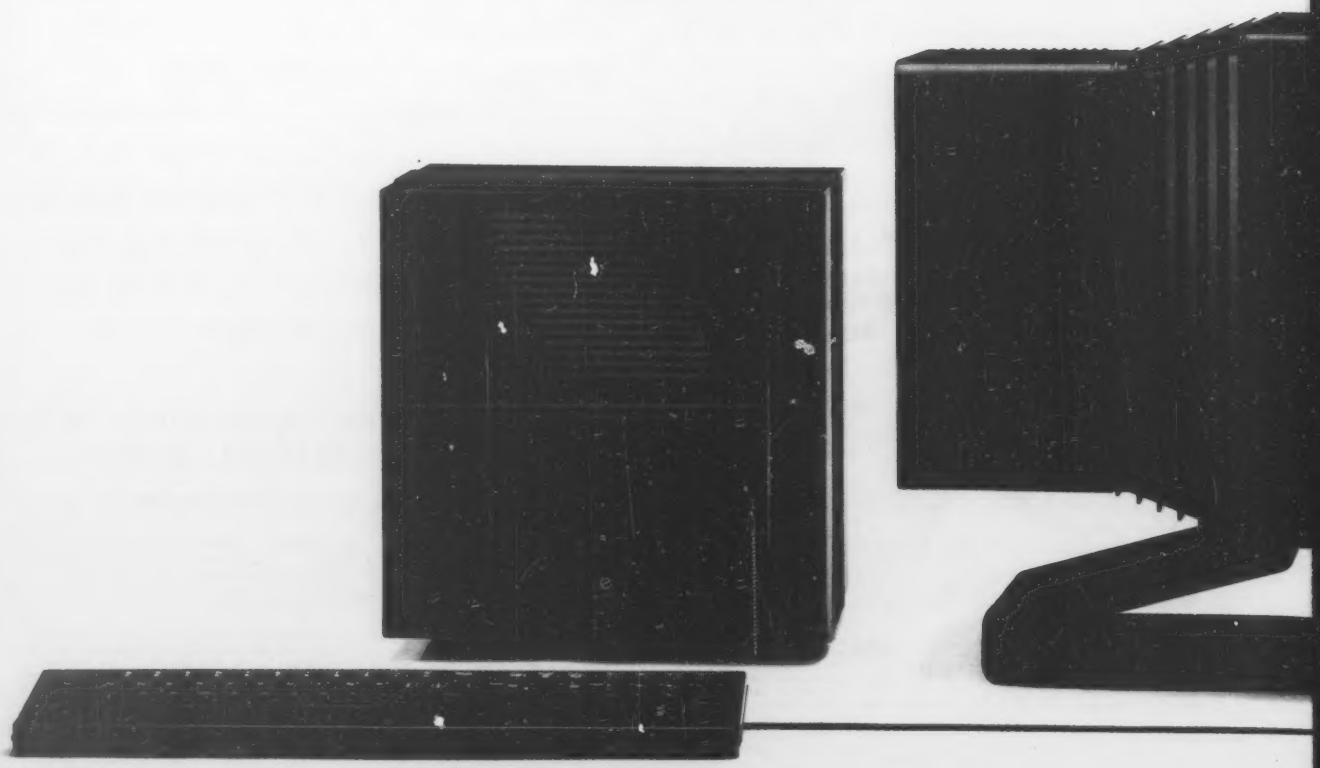


4 While PostScript® has long been the industry standard for printing, NeXT has made it fast enough to also be used on the display. This "unified imaging model" ensures that what you see on



the display is precisely what you will get on paper. All your work, in any size type and any degree of rotation or magnification, appears with perfect 92-dots-per-inch clarity on the NeXT MegaPixel Display. And with laser precision at 400 dpi on the NeXT Laser Printer.

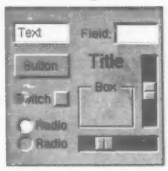
IN THE 90s, WE'L
ONLY TEN REAL BREAKTH
HERE ARE SEV



5 The NeXT Computer System is the first to be capable of producing CD-quality sound. Without requiring any additional equipment. This feat is made possible by a chip that has been specifically designed for the task of manipulating sound–the Digital Signal Processor (DSP). Because this processor is standard in every NeXT machine, software developers will be able to call upon its power to enrich programs we use every day. Now computers will not just be seen, but heard.

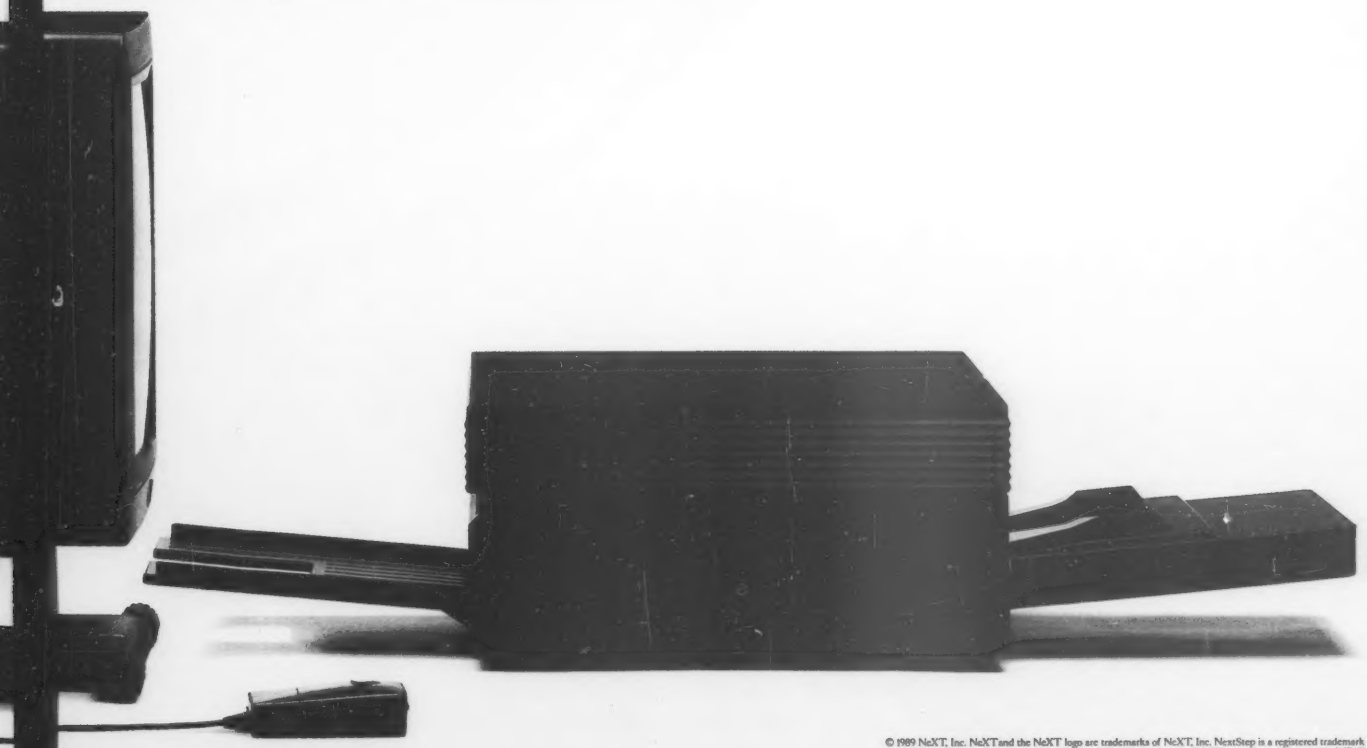
6 NeXT Mail takes electronic communications beyond anything you've seen on a personal computer before. Now you can send and receive multimedia mail–including text (with varied type fonts, styles and sizes), graphics and voice messages. And despite its high level of sophistication, NeXT Mail is so intuitive, you may not ever need to open the manual. NeXT Mail is built into the system, along with Ethernet and TCP/IP, so the NeXT machine can quickly become a part of existing networks.

7 Programmers can create software on the NeXT Computer up to ten times faster than on any other computer–the result of a breakthrough called NextStep.® It gives software developers the power to create the graphical user interface portion of their applications (often the most time-consuming and difficult part) without any programming at all. This revolutionary environment means we will see more programs, and better ones, in less time than ever possible before.



These seven breakthroughs will change the way we use computers in the 90s. Which is why Businessland, the leading supplier of computers to corporate America, chose the NeXT Computer System as the workstation they will offer. Call us at 800-848-NeXT, and we'll send you a 28-page brochure describing the NeXT Computer. We'll also give you the address of your nearest Businessland Center. There, you can experience for yourself the first seven breakthroughs of the 90s. And get a good idea where the next three will come from.

L PROBABLY SEE ROUGHS IN COMPUTERS. EN OF THEM.



© 1989 NeXT, Inc. NeXT and the NeXT logo are trademarks of NeXT, Inc. NextStep is a registered trademark of NeXT, Inc. PostScript is a registered trademark of Adobe Systems, Inc. UNIX is a registered trademark of AT&T.

Firms say no thanks to the Memories

BY JAMES DALY
CW STAFF

U.S. Memories, Inc. — the organization formed last June to create a united front of domestic electronics companies that could challenge the Japanese dominance of the semiconductor market — is facing every party-thrower's greatest fear: What if no one comes?

Last week, both Sun Microsystems, Inc. and Unisys Corp. said they will not join the organization, thus adding their names to the list of similar rejections from Apple Computer, Inc. and Tandy Corp. Compaq Computer Corp. said it is not actively planning to join.

The lukewarm responses from some of the largest memory users in the industry have cast lengthening shadows over what has been considered a well-intentioned consortium. While the group received a hero's welcome when it was announced, no new members have joined the seven founders: IBM, Digital Equipment Corp., Hewlett-Packard Co., Intel Corp., National Semiconductor Corp., Advanced Micro Devices, Inc. and LSI Logic Corp.

A prime reason for the reluctance, according to analysts, is the plummeting price of dynamic random-access memory chips. Japanese firms had used a practice known as dumping, or selling below manufacturing costs, to dramatically increase their market share, after which they would sharply increase prices.

However, the price of DRAM chips has declined overall. "The crisis atmosphere is no longer there," said Lane Mason, an analyst with Viking Research, Inc., in San Jose, Calif. Sun, for instance, has formed pacts with several international chip makers to provide a steady supply of the components even in a tight market. Would-be participants have also chafed at the high cost of entry into U.S. Memories — $5 million and up.

Additionally, Mason said, some hardware vendors feel they are going "downstream" by investing in semiconductor concerns, believing instead that their money would be better spent on software and hardware components.

Nevertheless, U.S. Memories President Sanford Kane downplayed the setback. "Sun is only one of 18 companies considering investing in U.S. Memories," he said in a prepared statement. "There are more than enough [companies] to make U.S. Memories happen."

Kane is awaiting word from several companies that have expressed interest in the concept, including AT&T, AST Research, Inc. and Tandem Computers, Inc.

DG switches CEO in effort to turn finances around

BY RICHARD PASTORE
CW STAFF

WESTBORO, Mass. — In what appears to be an effort to stanch his company's financial hemorrhaging, Data General Corp. Chief Executive Officer Edson de Castro last week turned his post over to Ronald Skates, a DG executive with a strong background in finance.

DG's Edson de Castro

De Castro, one of five co-founders of the 21-year-old minicomputer maker, becomes chairman of the board and chief scientist. The moves are intended to let de Castro concentrate on the strategic direction of the company, leaving the day-to-day executive duties to Skates, DG said.

Analysts saw the change as an indication of DG's effort to gain control of its costs. "This is a sign that the company is going to strive very hard to shore up its bottom line," said Stephen Smith, an analyst at Paine Webber, Inc. in New York. DG suffers from the same syndrome that has afflicted other minicomputer makers — sagging demand for its proprietary systems. It lost $119.7 million on revenue of $1.3 billion in its fiscal year ended Sept. 30.

Skates' finance experience includes a stint as DG's senior vice-president of finance and administration. Before joining the firm in 1986, he was an audit partner at Price Waterhouse. He most recently served as DG's chief operating officer.

Analysts said the change does not cast aspersions on de Castro's abilities. It is simply time for a new generation to lead DG through its transition to open systems and cost controls, said Michael Geran, an analyst at Nikko Securities Co. International.

In today's world of open systems, success in the minicomputer market depends on price/performance, according to Geran.

In contrast, Geran noted, "in the proprietary world of five years ago, what mattered was engineering excellence."

Datapoint and the "D" logo are registered trademarks of Datapoint Corporation. "Your link to computing power" is a trademark of Datapoint Corporation.
ORACLE is a registered trademark of Oracle Corporation.

Supercomputer debate swirls over concerns on weapons use

BY ELLIS BOOKER
CW STAFF

An upcoming Bush administration decision on supercomputer export licenses to Israel has ignited a debate over who should be allowed to buy the fastest, most powerful computers from U.S. firms.

The controversy has centered on several export-license applications for supercomputers filed by a number of Israeli universities. Opponents fear that the computers could be used for missile and nuclear weapons research, particularly in the wake of allegations that Israel may have transferred sensitive military technology to South Africa.

Late last month, U.S. Sen. John Glenn (D-Ohio) urged the Bush administration to disapprove of the export licenses. Glenn said that it would be unwise to provide this technology to nations — such as Israel, Brazil and India — that have refused to sign the Nuclear Nonproliferation Treaty.

Glenn pointed to a 1986 report produced by America's three nuclear weapons laboratories that stated that the use of "large-scale computers" had reduced the number of tests needed to develop a 1955-vintage weapon from 180 to fewer than five.

"Sure, bombs can be made without [supercomputers]," Glenn noted. But that, he said, is not the point: "If supercomputers reduce the cost or the time required to acquire or perfect a nuclear weapon or nuclear-capable missile, then they should be controlled."

The wrangle over the supercomputer sale to Israel, in particular, is "ironic, given all the military weaponry technology the U.S. shares with Israel," said Jeff Canin, an independent analyst based in San Francisco.

An arms control official said that eight supercomputer export licenses for Israel are now under review by an interagency group composed of the U.S. Department of Commerce, the Department of Defense, the Arms Control and Disarmament Agency and the Department of Energy.

The applications for the licenses, primarily to universities in Israel, were filed between September 1987 and October of this year, the official said. The cases involve the following hardware systems: a Convex Computer Corp. C-240; a Cray Research, Inc. X-MP/18 and X-MP/14; and IBM 3090 Models 200S, 300S as well as 200E and 180E, both with vector facilities.

Changes in attitude

Whatever the outcome of the Israeli sales, however, Canin said he expects a U.S. policy change to make it somewhat easier for some countries to get supercomputer technologies through U.S.-sanctioned channels. The Commerce Department is currently writing a new set of rules for supercomputer exports. Those guidelines would replace a draft that met stiff industry opposition last year, and they are expected to be filed soon with the U.S Office of Management and Budget.

Canin noted that the Finnish State Computer Center in Espoo earlier this year installed a Cray X-MP EA/14, the low end of Cray's product line. A few years ago, such a sale would have been inconceivable, given Finland's close geographic and diplomatic ties to the Soviet Union, Canin said.

Regarding the export licenses to the three nations, a Commerce Department spokesman said it was policy to keep all export license information confidential.

At the U.S. Department of State, Robert Mantell, a senior advisor to the assistant secretary of political military affairs, said, "Israel's applications are being scrutinized very carefully, as are all supercomputer applications from countries not parties to the Nuclear Nonproliferation Treaty."

Mantell also said that the U.S. and the Israeli governments jointly operate a supercomputer in Israel for "cooperative military projects."

For its part, Cray said the company does not make announcements or confirm negotiations. The company does not have a contract for a system going to Israel, according to a spokesman. Cray reports that 86 of the 227 supercomputers it has sold to date have gone to 19 foreign markets. Israel is not on the list of Cray client countries.

Officials at the Israeli embassy in Washington, D.C., could not be reached for comment.

While his department is working on new guidelines for supercomputers, Secretary of Commerce Robert A. Mosbacher said in a speech in Frankfurt, West Germany, last week that the recent changes in Eastern Europe will not lead to wholesale changes in U.S. export rules.

"We seek a growth of peaceful trade," Mosbacher said. "But the export controls, which we and our allies have in place, will remain in place." These controls are a "function of national security, not economics," he said, adding that only "essential technologies" will be controlled. Mosbacher did not specify which technologies are designated essential.

If you can plug it in, chances are Datapoint can connect it.

If you want to connect any of these...

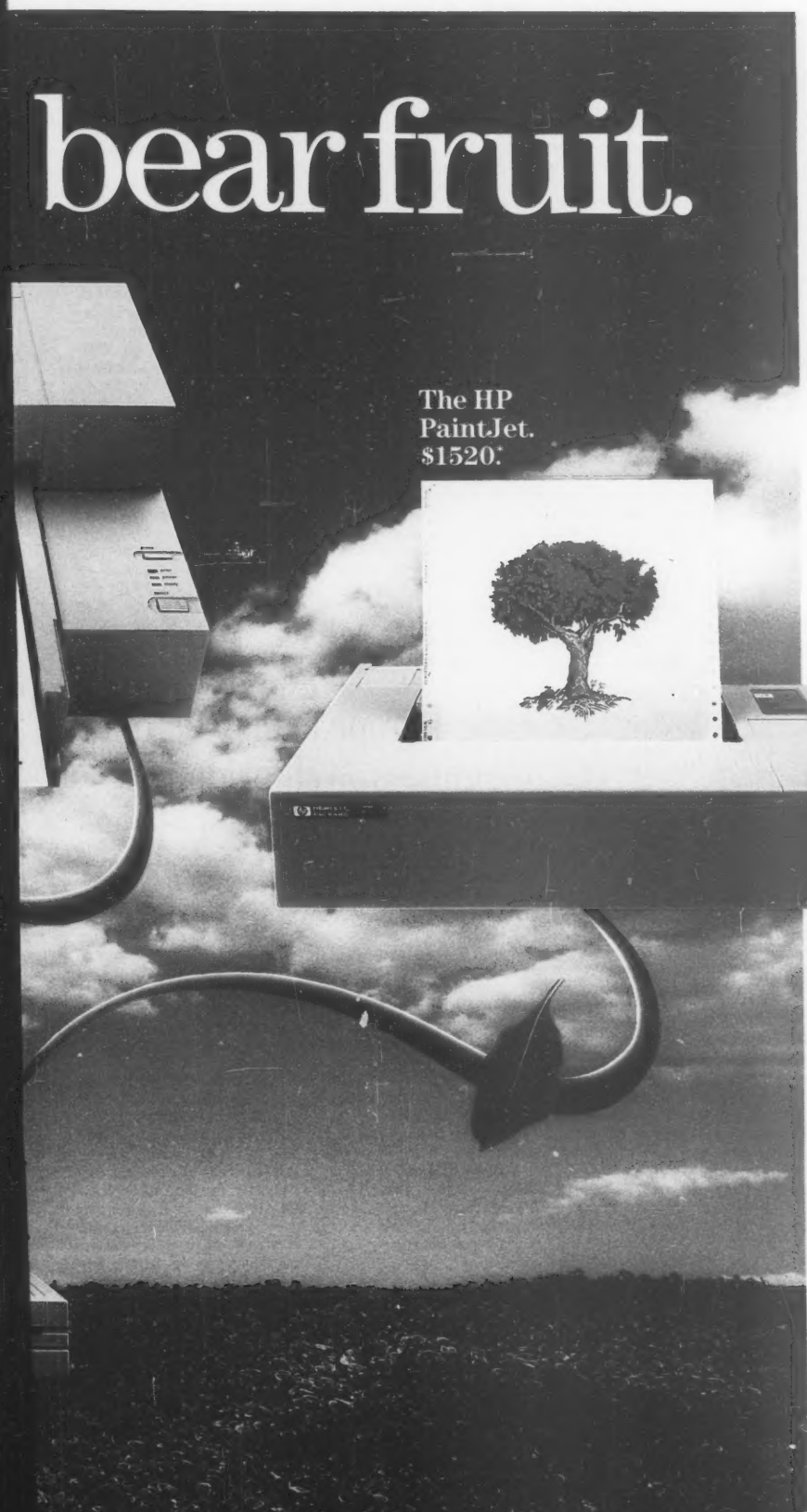
ASCII terminals
backup systems
facsimile
file servers
LAN servers
mainframes
minicomputers
modems
multiprocessors
PBXs
PCs
printers
scanners
supercomputers
superminis
telex terminals
video conferencing equipment
workstations
or others, we need to talk.

It takes a lot more than computers to make a network. Datapoint, a leader in large-scale networking, offers superior connectivity for a wide range of computers and peripherals. And our new DATALAN/XA SMB server software can enhance your industry-standard network with a range of shared capabilities including NETBIOS, SNA, OSI, TCP/IP, asynchronous communications, and ORACLE® RDBMS. With thousands of networks in more than 40 countries, Datapoint has the experience you need to improve connectivity, maintain data security, and protect the asset value of your equipment. Link up with Datapoint. Call 1-800-334-9968. Or in Canada call 1-416-222-8005.

DATAPOINT
Your link to computing power.™

Finally, Apples
The HP DeskWriter. $1195.*
The HP ScanJet Plus. $2190.*
There are more than 8,000 named varieties of apples, including Newton's Head, Melon, Chenango Strawberry, Pawpaw, Northern Spy, Sheepnose, Esopus Spitzberg, Bullet, Old Foxwhelp, Gilliflower, Winesap, Large Never Fa Winter Banana and Monstrous Pippin.
*Suggested U.S. list prices. Documents created using PixelPaint and Aldus PageMaker® PageMaker is a U.S. registered trademark of Aldus Corp. © 1989 Hewlett-Packard Company PE12026

bear fruit.



Hewlett-Packard introduces the first complete line of peripherals designed specifically for the Macintosh. And your department's budget.

The HP DeskWriter personal printer delivers laser-quality text and graphics for much less than other 300 dpi printers. Along with such features as whisper-quiet operation and a compact 15″ x 17″ x 8″ footprint.

The HP ScanJet Plus scanner provides 8-bit photographic-quality scanning. Now you can get both image processing and text recognition for what you would expect to pay for a 4-bit scanner.

And the HP PaintJet color printer puts hundreds of colors right on your desk. So nearly everyone can create a masterpiece of fine art. Or a masterpiece of business. Because PaintJet can handle everything from spreadsheets to overhead transparencies. Of course, each of our peripherals is backed by the same high level of service and support you've come to expect from HP. Call **1-800-752-0900, Ext. 275G** for your nearest authorized HP dealer. And watch your Apples blossom.

There is a better way.

HEWLETT PACKARD

Bank takes own path to DB2

BY ROBERT MORAN
CW STAFF

MILWAUKEE — First Wisconsin National Bank of Milwaukee this month joined a handful of innovative corporations that are devising their own strategies to move from older databases to IBM's DB2.

A provider of computer services to about 7,000 users within its 40 member and 150 correspondent banks, the company began moving its data from CMI, a circa-1969 flat-file system to IBM's DB2 Version 2, Release 1 running under Enterprise Systems Architecture on an IBM 3090 Model 600 S.

Unlike other jerry-built migration paths, however, the bank's method has a hook — and some analysts say it has a catch that may also be shared by IBM's own future methods.

The hook was built in to enable CMI users to simultaneously update the CMI database and DB2 and give member banks access to customer data by tax identification numbers — a feature implemented through DB2. IBM specialists reviewed the design, especially the database calls, according to Robert Hoffman, project manager at First Wisconsin.

1st Wisconsin's Hoffman

According to Hoffman, all the data that the bank wants managed and stored on DB2 will be entered and maintained by using an internally developed table. The table is currently maintained by the information development staff and contains a flag that asks whether or not the data should be moved to DB2 from the older system, CMI, an Uccel Corp. product acquired by Computer Associates International, Inc.

"Developers will simply change a table entry to yes, provide the SQL needed to manage the difference in physical structure, which is minimal, and DB2 will be automatically updated or accessed," Hoffman said.

Hoffman added that with the migration hook, "the bank will be able to incrementally control the movement of its 7,000 users to a relational system that reflects the customer's relationship with the bank." In addition, the new DB2 system is evolving along with the corporate data model and allows support teams to learn and grow with the application rather than doing it all at once, Hoffman said.

At the same time, the additional functions that the new DB2 database supports are being rewritten in the Application Productivity System software from Sage Software, a key piece in the move away from the CMI environment and one that will provide a complementary migration development and maintenance environment to the DB2 database and eventually spell the end of CMI use within the company.

Wait a minute

However, analysts said that there could be a catch to the methodology and its variants. Colin White, president of Database Associates, a consultancy in Morgan Hill, Calif., said the method, while innovative, faces the same difficulty confronted by others — the difficulty that IBM must face when it brings forth a feature next year for converting from IBM's IMS database management system to DB2.

According to White, the file structures of the original database are often not well designed and are generally slanted toward the requirements of particular applications.

But the larger issue is that such methods, including IBM's migration from IMS to DB2, will encourage people to design databases to the lowest common denominator, the older applications, "rather than designing DB2 databases as they should be designed," White said.

Hoffman said the integrity of the DB2 database was not compromised by the existing file structures and will not change upon implementation.

According to Shaku Atre, a partner at Atre Computer Assistance, a division of Coopers and Lybrand, in Rye, N.Y., the methodology will likely be a precursor of strategies for migrating from databases such as CA's IDMS and Software AG's Adabase in the future. Hoffman said that it is a fair assumption.

However, Atre claimed that interoperational issues between the two databases would add another layer on top of DB2, cause performance degradation and require more storage and more CPU cycles.

"The application team in conjunction with the database administration area tuned the systems," Hoffman said. "The inherent design of the system limited the performance degradation and additional costs."

DRAM thefts unnerve Silicon Valley firms

BY JAMES DALY
CW STAFF

An uneasy feeling creeps over the Silicon Valley these days when the sun slips down. From Fremont to Sunnyvale, assembly houses and computer manufacturers are making a second check to see that doors and windows are bolted tightly.

In recent months, a string of dramatic and violent armed robberies have been carried out with the surgical precision of a commando raid. The perpetrators are gunning not for cash, but something equally valuable: dynamic random-access memory (DRAM) chips.

Isis Surface Mounting, Inc., a small assembly house in San Jose, was attacked recently at 3:30 a.m., during a graveyard shift it normally does not run. Two men armed with semiautomatic pistols burst in and quickly tied up two employees. "They knew exactly what they wanted," said President Chris Hoolhorst.

"They went right for the DRAMs and ignored all kinds of other things, even components that were worth just as much or more," Hoolhorst said.

The thieves sprinted into the night with more than 100,000 chips worth more than a quarter of a million dollars. To date, there have been no leads, no suspects and — worst of all — no telling when they will strike again.

In the past year, a series of smaller companies such as Isis, Micronics Computer, Inc. and Vantronic Corp. have been hit, netting thieves hundreds of thousands of dollars worth of DRAM chips.

"In the right hands and in the right quantities, the chips are worth as much as small gemstones," said Sgt. Dave Flory, a detective at the San Jose Police Department. "They may not look like money, but in some cases, they're worth more than the bills we carry in our wallets."

Although the chips sell for less than $3 each, the enormous quantities being stolen can sometimes represent a small fortune. The chips are also a criminal's dream. They are only about the size of a paper clip, making them easy to hide, handle and dispose of. They also lack identifying serial numbers.

The victims so far are usually small, newly formed organizations in which security is an afterthought — companies that, as Flory described it, "have yet to abandon the 'we're-one-big-happy-family' attitude."

While the pinching of personal computers and peripherals has perenially dogged the industry, the stepped-up level of violence has left longtime area lawmen stunned. Some say the change could result in a new generation of criminals.

"It may be a new way of trying to intimidate their victims," said Bob McDiarmid, a Los Gatos, Calif.-based private investigator, who served as the sheriff of Santa Clara County before starting his own business. "Maybe they figure there will be less chance of them going to the authorities."

While inside jobs once accounted for most chip thefts, the focus is beginning to move away from company opportunists. "We're hearing reports that some burglary rings are stealing to order," said Donn B. Parker, a specialist in information security at the Palo Alto, Calif.-based SRI International. "You contact them and tell them what you need. Then, they go out and steal it for you."

Budgetary constraints and limited manpower have shortchanged local investigative efforts — Flory is his city's only high-tech theft investigator — and made victims vulnerable and bitter. "If there is an investigation, it must be a very limited one," Hoolhorst added. "I haven't heard anything yet from the police department."

Once stolen, the chips are usually sold to a "fence," who buys the hot items at a ridiculously low price. The fence could then resell them to a so-called gray market company — a legitimate vendor of electronic parts who does not always inquire where the components he sells come from. Since these companies also deal in legitimate parts, they operate in the open.

Gray market companies also serve a real purpose for manufacturing companies that are occasionally forced to go on "fishing expeditions" to get components that are in short supply through normal distribution channels.

Flory said the chips stolen in the Valley usually make their way down to Los Angeles, where they are then shipped to Taiwan or the East Coast. "It's a very elaborate process that we are just beginning to get a handle on," Parker added. "But unless we get on top of it now, I think we're going to see a whole new crime focus in this area."

U.S., Europe firms call for toughness on chip dumping

BY RALPH BANCROFT
IDG NEWS SERVICE

PARIS — Semiconductor manufacturers from Europe and the U.S. have jointly called for tougher action against chip dumping.

At a meeting of the European Electronic Component Manufacturers Association (EECA) and the U.S.-based Semiconductor Industry Association (SIA) last week a decision was also made to investigate possible cooperation in the high-definition television (HDTV) market.

The organizations said they wanted to see rules introduced to "deter injurious dumping" and not ones that simply "identify and proscribe dumping after it has occurred," according to an official communique.

Money, too

The two groups also want to see all costs included in calculations used in fair-pricing agreements. The European Community (EC) reached such an agreement with Japanese dynamic random-access memory chip makers two months ago after lobbying by EECA.

The pact establishes a floor price for memory chips based on the most efficient producers' costs. There has been a running argument for some time about how these costs are worked out.

The two industry groups want to go further down the protectionist road and are looking to individual governments and the current round of the General Agreement on Tariffs and Trade to prevent dumping before it takes place.

The agreement with the U.S. firms will strengthen EECA's hand as it tries to fend off an EC Commission proposal that says now that a fair pricing agreement has been reached, the EC should remove the 14% tariff on semiconductor imports. Neither the U.S. nor Japan has such a tariff, which computer companies complain is far higher than the 4% tariff on completed subassemblies that use semiconductors.

HDTV could turn out to be an important market for the semiconductor companies; it is estimated that televisions using the technology will use 10 times the number of chips as today's TV sets.

Open, Cooperative Computing.

Our Open Attitude Toward Change Goes Far Beyond Industry Standards.

NCR

Open, Cooperative Computing.
The Strategy For Managing Change.
Coming February 1990.

Encore chooses two-pronged strategy

BY MARYFRAN JOHNSON
CW STAFF

FORT LAUDERDALE, Fla.— Encore Computer Corp. joined the growing list of vendors keeping one foot in two distinctly different worlds last week, with product lines dedicated to both proprietary architectures and "open systems" Unix-based machines.

Encore Chief Executive Officer Kenneth Fisher announced a "new product direction" for his company with a Motorola, Inc. 88000 microprocessor-based system, scheduled to make its debut late next year. The new family of multiprocessor systems will reportedly integrate the Unix architecture with Encore's proprietary MPX environment.

Making Unix available to its installed base — worth about $1 billion to the company — will provide "a greatly enhanced software development environment while retaining the advantage of MPX for runtime," Fisher noted.

Encore also announced the availability of a new high-end system in its proprietary line with the Concept 32/2000, a superminicomputer that offers at least three times the speed and power of its predecessor in context switch times, task-to-task dispatch, I/O throughput and deterministic performance.

Deterministic performance — the computer's ability to mimic real-world conditions instantly — is particularly crucial in flight-simulation training, said Charles Anderson, a spokesman for Encore.

Pricing for the new 32/2000 is still under discussion, Anderson said, but the machine is expected to cost less than $300,000.

Encore's prime markets are in military and commercial flight simulation and training, systems telemetry and utilities energy simulation.

The company's entrance into the real-time market came about through the acquisition of SEL/Gould Computer Systems, former maker of the MPX-based product line.

Paul Zorfass, vice-president of computing research at The Yankee Group, a Boston-based consulting firm, said that the ability to offer real-time Unix to its high-end technical users will give Encore a competitive boost against such rivals as Concurrent Computer Corp., Digital Equipment Corp., Harris Corp. and Bolt Beranek and Newman, Inc.

"This is an area being pushed forward by a number of companies. Everyone wants to get in on the open-system growth," Zorfass said.

The new 88000-based real-time systems will add a fourth product line to Encore's Concept machines, its Unix-based Multimax parallel and multiprocessing systems and the Powernode simulation and image-processing systems acquired from Gould.

The technical real-time market was worth about $1.6 billion in 1989 and is growing annually at about 7%, according to Chuck Casale, one of the founders of the Aberdeen Group, a Boston-based consulting firm.

Win a free trip to Communication Networks '90

And get all the details on America's premier communications conference just by entering.

Next February, a major event in voice and data communications will take place in Washington, D.C. In just four days, you will be able to gather the latest, most up-to-date information on the fast-changing world of communications at the 12th annual Communication Networks '90.

Fifteen in-depth tutorials will cover everything from "Integration and Connectivity" to "Regulatory Issues in Telecommunications." More than 80 conference sessions will bring you up-to-date on subjects like LANs, Network Management, High Band-Width Transmission, ISDN, Standards, Security and Inter-enterprise Networking. And 400 industry-leading exhibitors will give you information about their newest communications products and services.

Selected by the Department of Commerce for the second year in a row to participate in its elite Foreign Buyer program, Communication Networks '90 will give you access to the entire world of voice and data communications technology. As one of the winners of our contest, you could win a free trip to this unique event.

Just send in the form to enter.

When you complete and return the form below, we'll make sure you get complete details on Communication Networks '90 as they become available. AND, we'll automatically enter you in our contest for one of these three prizes:

1. Free air fare, hotel and conference admission. As First Prize winner you will get round-trip airfare from your nearest major airport, three nights at the luxurious Grand Hyatt Hotel, free admission to three days of conferences and the exposition, plus your choice of one day-long, in-depth tutorial. Approximate total value: $1,875.
2. Free accommodations and conference admission. Second Prize winner will receive three nights accommodations at the Grand Hyatt, plus one in-depth tutorial and free admission to the full conference and exposition. Approximate total value: $1,375.
3. Free conference admission. Third prize, valued at $895, includes your choice of one day-long, in-depth tutorial and full conference and exposition admission.

There's no way you can lose!

Whether you win a prize or not, you win. You will get information on a conference and exposition that can give you the expertise you need to stay ahead of your competitors. Send in the form today, or FAX it to 508-872-8237.

Summary of Contest Rules

Entry Form must be filled out with *all* information requested and received at the address shown NO LATER THAN November 30th, 1989. One entry per person; one prize per person. No registration is required to enter, but if you win after you have registered, you will receive a full refund. Winners will be chosen at random and announced on December 15th, 1989. Decision of the judges is final. All residents of the continental U.S. and Canada 18 years or older are eligible, except employees of International Data Group, its agencies, affiliates or subsidiaries. Winners must consent to the use of their names and photographs in contest publicity.

For a copy of the complete contest rules, or a list of winners, send a self-addressed stamped envelope to Communication Networks '90, P.O. Box 9171, Framingham, MA 01701.

COMMUNICATION NETWORKS
CONFERENCE & EXPOSITION

Taking Networking into the 90's

Washington, D.C. • February 5-8, 1990

C O N T E S T • E N T R Y • F O R M

Please enter my name in your Communication Networks '90 contest and send me full details about the conference and exposition. I understand I must fill in this form completely in order to be eligible.

Name _____ (please print or type)

Title _____

Company _____

Address _____

City _____ State ____ ZIP _____

Telephone (____) _____–_____

FAX (if available) (____) _____–_____

List the five communications/networking topics in which you are most interested:

1. _____
2. _____
3. _____
4. _____
5. _____

CNB1

When filled in completely, mail to:
Communication Networks Contest
P.O. Box 9171, Framingham, MA 01701-9171

Nynex strike draws near apparent end

BY ALAN J. RYAN
CW STAFF

WHITE PLAINS, N.Y. — The Communications Workers of America (CWA) appears to be nearing the end of its three-month strike against Nynex Corp., with Nynex claiming that workers could be back on the job as early as today.

In separate announcements last week, Nynex said it had reached tentative agreements on new labor contracts with the CWA, but the CWA said no tentative agreements had been reached.

"It is a matter of semantics," said Steve Rosenthal, a CWA spokesman. While the framework has been set for agreement on the regional issues involved in the strike, "We do not consider it a tentative agreement until the bargaining committee has approved it," he said.

Rosenthal added that the CWA and Nynex are now bargaining on local issues, which normally would not begin until the regional issues had been settled. "The fact that we're doing that indicates that we're over the major hurdles and will continue to plod along and hopefully in the next few days reach an agreement."

The CWA spokesman also said it seemed unlikely that 40,000 workers represented by CWA would return to their jobs by today.

John Bonomo, a Nynex spokesman, said Nynex was awaiting formal approval of the agreements which had been discussed last Monday. Nynex has already reached tentative agreements with the International Brotherhood of Electrical Workers, a union representing 20,000 Nynex employees.

If you'd expect to pay more for AT&T Digital Services, expect a surprise.

Everyone knows that AT&T ACCUNET® Digital Services offer the highest quality. But until now, you worried about paying a higher price.

Your worries are over.

We've just made dramatic cuts in the prices of our family of ACCUNET Digital Services. No matter what size or type of business you're in, now AT&T has a digital service that's right, at a price that's right on the money.

First, we're introducing rate cuts of up to 34% on T1.5 and up to 41% on T45, depending on mileage. Which means, on a month-to-month basis, AT&T costs less than those so-called "bargain" carriers for a typical circuit.

Next, our Multi-Service Volume Pricing Plan adds significant volume discounts to those reduced prices. And if you use more than one of our digital services, you can now combine revenue volumes for DDS, T1.5, T45, International ACCUNET Digital Services* and ACCUNET Spectrum of Digital Services. You can even move from service to service as your needs change with no penalty. Try to find volume discounts like that with any other carrier.

There's more. Now we offer term discounts on T1.5 and T45 that enable you to purchase one to five years worth of service at additional savings of up to 24% off the month-to-month price.

If these discounts sound like good reasons to look into AT&T digital services, here's yet another reason to act quickly. *Through December 18, AT&T will waive all nonrecurring charges, even on office multiplexing, when you purchase T1.5 or T45 with an interoffice channel circuit.**

And remember: if information is critical to your business, AT&T quality is something you can't afford to be without. We have the largest fiber network, more digital route miles and the greatest redundancy of any carrier. Plus AT&T offers T1.5 users a comprehensive Network Management program to help ensure trouble-free service.

Get the best quality service at the best possible price. Call your AT&T Account Executive or **1 800 222-0400** to find out how much our new discounts can save your business.

AT&T
The right choice.

*Pending FCC approval.

© 1989 AT&T

EDITORIAL

Bomb the ban

TWO SUMMERS AGO, a distinguished delegation from the Soviet Union visited our offices. Included in the delegation were the Soviet's chief technology liaison and the nation's de facto senior computer technologist in charge of dispersing the few Western-made computers available to Soviet bureaus and manufactories.

The stated reason for the visit was look to at some of *Computerworld's* editorial production systems. (They were most unimpressed, noting that *"Pravda* has a much better text system." They were, however, spellbound by our Macintosh graphics shop.)

The real reason for the visit, however, was to deliver a message: "Glasnost is for real, so please advocate lifting the many bans and restrictions on your nation's stock of computer equipment and help us to grow our nonmilitary economy."

The events of the past month in Eastern Europe have been nothing less than monumental. Unlike what happened last summer in China, the rush to reform throughout the Eastern Bloc is unlikely to be halted. On the contrary, the Soviet government is on record as fully supporting the movements in East Germany, Poland, Hungary and now Czechoslovakia. The Cold War had gotten too damn expensive for the Soviets, whose domestic economy is a mess.

Clearly, the time has come for an expeditious reassessment and debate on the merits of lifting the remaining ponderous restrictions on technology shipments to the Eastern Bloc. Therein lie huge consumer economies just waiting to develop, but that cannot happen without the enabling technology. And now that the Eastern Europeans are getting a scent of post-World War II prosperity, time is of the essence if we are to turn these former adversaries into friends and trading partners.

The U.S. computer business could certainly use some new markets. Our Japanese and Western European competitors are surely alert to the budding opportunities.

The potential market is not limited to hardware and software makers. If these countries just throw technology at their massive development problems, very little will be accomplished. We need to send over the equivalent of high-tech SWAT teams, replete with technologists, systems integration specialists, economists and consultants.

There is no question that the Eastern Bloc has provided many an illegal entry point for contraband computer equipment en route to the Soviet Union, often for military purposes.

But, as has been stated before, the wars of tomorrow will be fought in the boardroom and factory floor, not on the battlefield, and we need all the allies and trading partners we can get. There is an unprecedented opportunity here.

The breadth of this opportunity was put most eloquently by Lech Walesa while addressing the U.S. Congress last week: We need your help now. We promise we'll never forget it.

NEWS ITEM: NAVY CHARGED WITH IBM BIAS IN EQUIPMENT PROCUREMENT.

LETTERS TO THE EDITOR

Serious server

"Gupta SQLbase shoots for portable front end" [CW, Oct. 30] does not accurately describe our company's position on the Microsoft SQL Server.

Our SQLbase marketing group is indeed a very serious competitor to Microsoft's SQL Server efforts. We expect that SQLbase and SQL Serve, along with Oracle and OS/2 Extended Edition, will split the worldwide market for database servers running under OS/2.

However, your story does not fairly describe the support of our independent SQLwindows marketing group for SQL Server. We intend to join Microsoft in championing Windows as a graphical PC environment and make SQLwindows the premier front end for SQL Server. SQLwindows is available for sale today and is ready to take on Dbase V, Lotus/DBMS and Paradox PM whenever the vendors of those products are ready.

Rod Zimmerman
SQLwindows Product Marketing Manager
Gupta Technologies, Inc.
Menlo Park, Calif.

Let it be

Recent proposals to forcibly divest the airlines of their computerized reservation systems [News Shorts, CW, Oct. 23] bear witness to the general misunderstanding of a free market and competition therein.

The level of competition isn't determined by number of competitors, market share or technical superiority; it is determined solely by whether interested parties are free to participate in the market or not. In a free market, even an industry served by only one firm is still subject to competition due to potential entry by other firms. Only government, through the coercive power of legal sanction, can turn a free market (i.e., an uncompetitive market) into an unfree one. Nothing market participants can do can achieve this end.

For those of us in IS, as we stand at the dawn of the information age, legal proscriptions against the ever more effective use of information technology should be particularly troublesome. The answer we should give those who seek to squelch strategic information systems is "laissez faire, laissez passer."

Chris Pickering
President
System Development, Inc.
Denver

IS curriculum

I was amused by the criticism leveled against my research study results published in "MIS majors: Can they meet business expectations?" [CW, Sept. 11] by Mr. Danny Gmeiner in his letter [CW, Oct. 16].

The tone of the letter seems more like a politician's diatribe than a professional's concern, especially when he "shudders at a politician defining the IS curriculum."

Many CEOs deplore the need for retraining the graduates in their own disciplines, purportedly equipped with adequate know-how. Many large organizations run their own training programs to meet their essential needs when they find deficiency rampant in their employees.

An earlier survey conducted by Duquesne University came up with similar results and recommendations, even though the Pittsburgh region is replete with "technical" industries! Even though Hartford is the insurance capital of the U.S., many large manufacturing and technical firms were also included in the survey.

My viewpoint is that operating systems and other advanced topics in the IS technology should be integral elements of the MIS curriculum, taught by talented and trained faculty — full-time or practicing part-time — for the benefit of the MIS majors so that they will have the requisite grasp of those topics.

As for Gmeiner's criticism against government support, I wonder if the aerospace, automobile and electronic giants could have survived at the times of crises without the support and bail-out by the government. ADA, supercomputers and similar developments are enriched by government commitment and support. Space research led to small computers. Every day we are reading about the crying need for cooperation among business, campuses and government.

I got many calls agreeing with my study and asking for more information. If such studies are replicated in different regions of the nation, we could come up with an IS curriculum of best fit!

N. Nagarajan
Associate Professor of MIS
Central Connecticut State University
New Britain, Conn.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*

Caught in career-path red tape

MARTIN GROLNIC

It is not easy for a government IS professional to make a career switch to the private sector. Unless he works in select agencies, his computer system is probably not up to date, which makes him technically obsolete, and he will probably be unmarketable at his salary.

However, if he stays with the government, his salary will increase, but promotional possibilities will stop because of mandated salary ranges. Unless the IS professional leaves the government within two to four years of entering it, he finds himself trapped.

Salary and promotion are not the only drawbacks. In its acquisition of computer systems, the government makes a conscious effort to foster competition among the major vendors by basing its buying decisions on costs. As a result, vendors substantially discount their systems, whereas IBM will not. The result is a far greater percentage of non-IBM hardware installed in the federal government. And since IBM dominates the private sector, this hinders a government worker from gaining invaluable machine experience.

This procurement policy also works in software purchasing for the government. Even if an agency has an IBM system installed, the probability is that the predominating private-sector database management systems are not being used in that installation.

Another detrimental element of the procurement procedure is the time it takes to acquire new hardware and software systems. The bid process extends the replacement cycle from a normal half- to one-year process to a one- to five-year time frame. Thus, even when a system is finally installed, it is no longer state-of-the-art technology.

Finally, a major impediment to the government professional is the Brooks Act. This congressional act forces the government to contract out to the private sector almost all new development work.

The result is that the IS professional finds himself either relegated to maintenance of older batch programs or becoming a timekeeper who acts as an overseer for the outside contractors.

Beyond these problems is the stratified government pay-grade system that pays for seniority and not performance. The government simply chooses to ignore paying for the skill or performance aspects of the computer profession.

JOHN BREAKEY

In general, most government programmers are underpaid, compared with private-sector counterparts, through the first two or three years of their government careers. By the end of their careers, the pendulum swings the other way, and they tend to be overpaid relative to the private sector. Senior government employees who wish to leave the government face perceptions such as the feeling that the government worker will not put in the necessary time to get the job done because of the general lack of urgency in most agencies.

So, what are the choices if a government worker wants to continue in IS? There are really only two: move to more of a leading-edge agency or department or leave the government while skill sets can still be leveraged.

There are certain departments within the government, such as the Department of Defense, that are working at state-of-the-art levels. But the major impediment to this approach is the difficulty of transferring between departments and agencies because of the particulars of each department's staffing rules and budgets.

The other alternative is leaving for private industry. The IS professional will be shocked at discovering his real worth in the IS world, but unless he leaves the government early in his career, he won't be able to realize the actual financial benefits for several years.

What can the government do to change the picture for the IS professional?

The first step would be to ensure that the early pay grades within the individual agencies are competitive with the private sector for the newly hired IS programmer. The problem after that, however, is not money, but a career path.

The government must realize that it cannot segment the components of the job or ignore that the IS profession is frequently technology-driven. Employees should be allowed to participate in the analysis part of a project, not just the programming; they should be involved in at least a percentage of developmental work; and there should be a more open, easy transfer policy within and among agencies.

In addition, the government must stop viewing the IS professional as just filling a support function within an agency. Instead, allow him to move into more line functions within the organization.

In the end, the solution must be the same for both government and the private sector: Attract talented people early in their career and keep them motivated. The government has the compensation available, but it must be more creative in addressing the IS professional's needs and allowing mobility in his field.

Grolnic is area director for Source EDP in McLean, Va.

In the 'Age of Reason,' flat means good news

JEFF ANGUS

Believe me, the flat 1989 sales of software packages in the midst of a growing, healthy economy is a good sign.

For software, the period between 1986 and 1988 (I call it The Gilded Age) saw sales explode. Sales were up as much as 50% a year, even with the 1987-1988 price hikes of staple products such as programming languages and memory chips.

Even with prices working against expectations, business software purchases continued to rise. This behavior could only be called "panic buying," because no organization could usefully absorb 50% increases in software, especially in the light of recent tight IS budgets.

The Gilded Age software boom was fueled by brute stupidity, the same kind of thinking that has Congress providing the Strategic Defense Initiative with "only" $3 billion because it has now discovered that it can't possibly work. Sure, some organizations made good use of their new programs, but more often than not, personal computers and shrink-wrapped software were simply thrown at business problems. This approach comes from the belief that if you can just buy "the right product" you can solve your problem, from getting a date to losing some weight.

Well, some buyers bought software using computer savvy, but the bulk of them didn't apply the requisite first step of solving business problems — business thinking.

Software houses helped to create this wave of dysfunctional buying. They weren't selling on "can-do" but on "cram-do" — how many features they could hammer into one 640K-byte package. The technical fixes that allow code to exceed 640K bytes only exacerbated this mind-set.

By and large, the microcomputer trade press went along with this, huckstering vapid benchmarks such as Landmark tests and SIs and whetstones instead of examining what technology can do for a business.

Waste of money

For Gilded Age product buyers, failure to solve a business problem with a package was an excuse to buy another. But what difference does it make whether an organization uses Lotus' 1-2-3 or Excel or VP Planner if the staff can't articulate a business strategy through the use of the product? Who cares about macro execution speed if the finished output doesn't add value to the raw data and no one can use it to improve the organization's competitive position?

The software slump indicates that the profligate Gilded Age is temporarily over. The individuals who oversee technology budgets have slowed buying and are now trying to rationalize the vast billions of dollars in investment that coincide with a decline in white-collar employee productivity. A new stage in the technology is occurring.

Many corporate technology implementors will not be able to cope with the change because they are required to understand the business they're supporting as much as the products they're supporting. Their failure to adapt is a positive Darwinian evolution.

That same evolutionary imperative is likely to winnow software vendors. Who'll have the best chance of survival? Those that learn to provide customized service to buyers. Those that come to understand their own products not just as shelf units but as business tools that real people use to solve real problems will have a better chance of surviving and thriving in this new period, the Age of Reason.

The evolutionary grinding will take its biggest toll on neither the vendors nor the corporate buyer, but on the organizations that have been the biggest consumers of this technology. There are three most likely paths for those organizations:

- **Status quo.** Many organizations will, either through inertia or naivete, ignore the problems of the past. They'll fall victim to their competition, which is adapting to change.
- **Fatalism.** Some outfits will give up continued investment in technology because synthesizing business savvy with software has been too tough. Rather than make changes to hiring and training practices, they'll continue to hire techno-nerd propellerheads or overcompensate by bringing in nontechnical managers to run technology groups. Neither move will synthesize the necessary business technology solutions.
- **Reason.** There's only one survival choice — continued investment in technology. This must be annealed with a redoubled determination to combine technology with internal education of technology implementors on the business' goals. For the managers and staff that can make the transition, firms need to provide a constant stream of thought-out information on their industry in general and their own structures in particular. They need to get IS an evolving perspective of the non-IS technologies that are transforming organizations and the way they do business. They need to understand that information fuels the adaptive organization that will survive to see the year 2000.

The software slump is only the first symptom of a major movement. The destination: either evolution or extinction.

Angus is a manager at Farallon Computing, Inc., a manufacturer of Macintosh networking hardware and software in Berkeley, Calif.

What would you use a MicroVAX for?

(This is a multiple choice question.)

*Based on 5-year hardware, software, maintenance, and staffing costs. Source: Customer Satisfaction Research Institute.
© Digital Equipment Corporation 1989. The Digital logo, Digital has it now, MicroVAX, VMS, and VAX are trademarks of Digital Equipment Corporation. IBM is a registered trademark and OS/2 is a trademark of International Business Machines Corporation. Macintosh is a registered trademark of Apple Computer, Inc. UNIX is a registered trademark of American Telephone and Telegraph Company. MS-DOS is a registered trademark of Microsoft Corporation.

digital™

A TO GO WHERE BIG COMPUTERS CAN'T.

MicroVAX™ 3000 systems may be the most versatile computers you've ever done business with. Most MicroVAX models are compact and quiet enough to rest on a shelf or beside a desk. So they fit right on the factory floor, in the front office, on the loading dock, in the R&D lab, in the retail store. Just plug one into the nearest wall outlet. Anywhere people work, a MicroVAX system can work beside them.

B TO GET HIGH PERFORMANCE AT A GREAT PRICE.

No other mid-range computer can match MicroVAX system price/performance. Prices start at under $8,500 for MicroVAX 3100 general-purpose systems and $7,000 for MicroVAX 3100 servers that expand to support 50 PCs. And owning a MicroVAX system is just as affordable as buying one. Compared to its competitors, MicroVAX 3000 systems cut the cost of ownership in half.*

C TO PUT ALL YOUR COMPUTERS ON SPEAKING TERMS.

Even the smallest MicroVAX systems offer local and wide-area communications. They make it easy for you to integrate whatever's on the desktop. Imagine MS-DOS,® OS/2,™ and Macintosh® PCs, Sun, and other UNIX®-based or VMS™ workstations, ASCII and windowing terminals all sharing information on a single, manageable local network, using Digital's Network Application Support (NAS). Then think about using NAS to be able to exchange this information with IBM and other-vendor mainframes using wide-area connections. Now you're talking.

D TO RUN THE APPLICATIONS YOU BET YOUR BUSINESS ON.

If you thought it just wasn't possible to buy one departmental computer to run all the applications you need, think again. MicroVAX 3000 systems run both technical and commercial applications equally well. And they run most of the PC programs you already use. In fact, over 6,500 VAX™ system applications, including factory automation, software development, and branch-office transaction processing, run on MicroVAX 3000 systems today.

E TO GROW YOUR BUSINESS WITHOUT OUTGROWING YOUR COMPUTER.

Every VAX family member is 100% software compatible. So you never have to rewrite applications as you grow. Start with a single MicroVAX computer that lets PC or workstation users stay with the system they like while gaining the extra disk capacity and file-sharing they need. You can choose your starting point from the MicroVAX 3100 on up to the MicroVAX 3900 system. And, you can always upgrade to a larger MicroVAX system. Or keep your original as is and "cluster" it with a new one for double the power, capacity, and availability. Need more? Grow right on up to our VAX 6000 system or new 9000 mainframe. There's no stopping you.

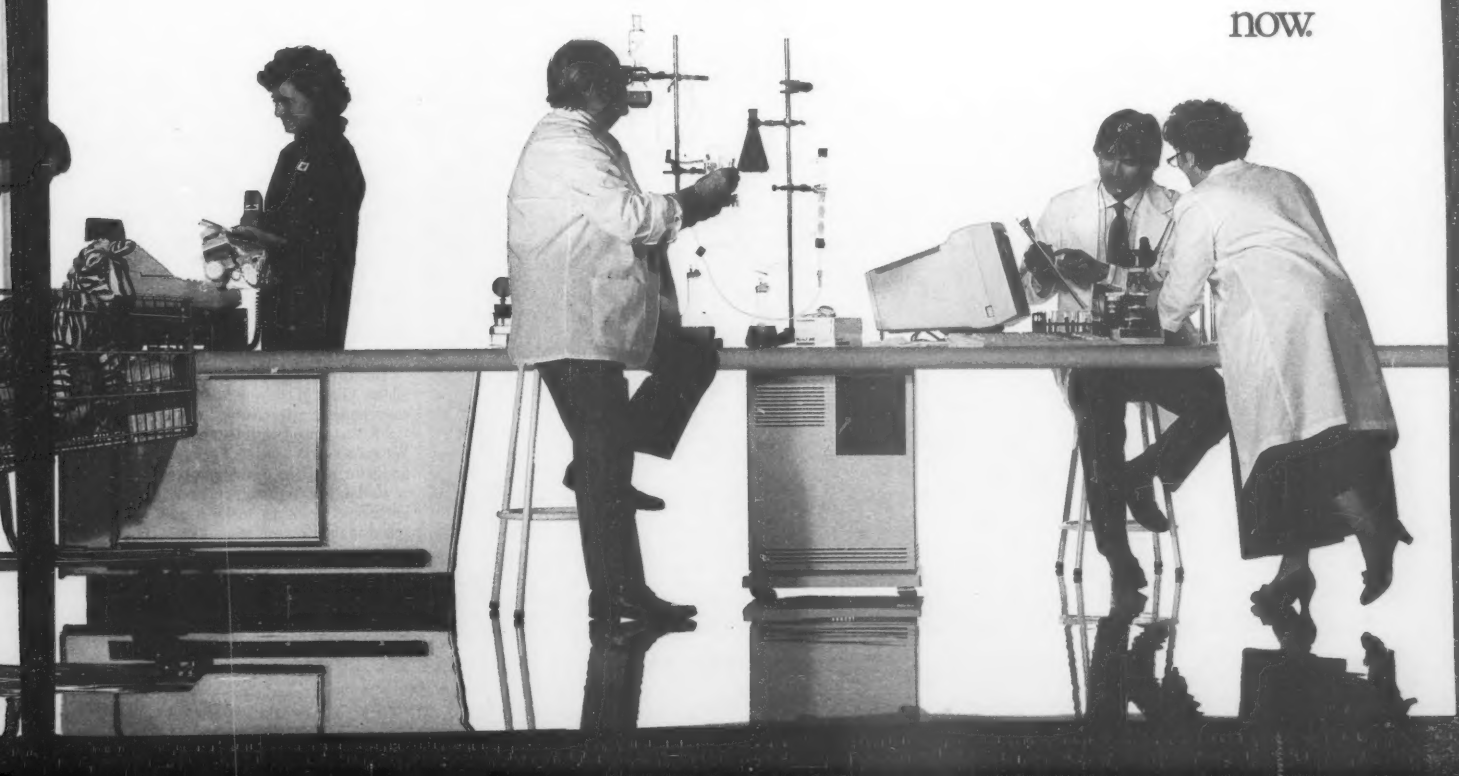
F TO DO WHAT YOU WANT TO DO–SUCCEED.

MicroVAX computers have played a key role in many companies' success stories–Toys 'R' Us, Blockbuster Video, and Alcon Laboratories, to name a few. That's why over 150,000 MicroVAX-based systems have been installed since their introduction in 1985. Add MicroVAX systems to your business, and start a success story of your own.

G TO DO ALL OF THE ABOVE. AND MORE.

For more information on how you can use MicroVAX 3000 systems for a competitive edge, call 1-800-842-5273, ext. 400. Or call your local Digital sales office.

Digital has it now.



High-tech speech, low-tech slide show

BILL LABERIS

If you haven't had this happen to you, no doubt you have at least observed the phenomenon.

The featured speaker approaches the podium as the lights dim. He dispels the pregame anxiety with a little throat clearing and a mildly funny story that also relaxes the audience.

High-tech audience (IS professionals), high-tech subject ("Emerging Information Technologies"). A strategic pregnant pause after the polite laughter fades. Eyes are fixed upon the speaker — and to the screen on his right.

"As my title slide implies (click) . . . as the slide says (click, click) . . . ah, there must be something wrong. Heh-heh, I guess this slide machine's not in real-time . . . " Brief ripple of nervous laughter.

The speaker fidgets ever so slightly but remains composed, because he assumes that technology will not fail him. And he hasn't missed Sunday Mass in over two years.

"Vinnie, want to give that thing back there a little kick? Yes, Vinnie, I know it's turned on, but as you can see it isn't working . . . "

"So did you hear about Dan Quayle's recent surgery . . . "

The jokes get increasingly feeble as Vinnie sends for reinforcements from the audiovisual suite. Meanwhile, the blank screen stares at the audience like a malevolent two-dimensional animal. The speaker repeatedly tries to clear his bone-dry throat. He wonders to himself why he didn't use overheads instead of slides. He wonders how many people will fall asleep if he tries to do this presentation without any visual aids whatsoever. He wonders if anyone will notice if he slips out the side door.

Eventually, Vinnie returns with a couple of teamsters who pronounce the system "busted," but acknowledge that the show can proceed with Vinnie dropping the slides in by hand (and removing same in similar fashion).

"Just signal me by saying 'next' ," Vinnie says brightly, and the presentation pitifully begins.

In the last three years, I have made well over 100 presentations on high-tech subjects to high-tech people. And I would not be exaggerating if I said that the slide portion of the presentation was screwed up to some degree at least one-third of the time. If the projector actually illuminates my slides, it inevitably goes backwards when I press the forward button. "Oops, we've seen that one, haven't we," I note while every hit of the button produces the wrong slide until they are hopelessly out of order.

IN THE LAST three years, I have made well over 100 presentations on high-tech subjects to high-tech people. And I would not be exaggerating if I said that the slide portion of the presentation was screwed up to some degree at least one-third of the time.

I've done everything to while away the painful minutes of system down-time, from reminiscing about my career (and I'm sure people are *real* interested in that) to making shadow puppets on the screen. Mating rabbits are a crowd favorite.

Earlier this month, I attended a very lavish dinner at an upper East Side mansion in New York. The cut crystal was magnificent. The hors d'oeuvres were divine. The waiters wore so much gold brocade I thought I'd stumbled onto a command post of the Colombian army.

And the slide show? Oh, it crashed — completely and totally. The presenters had the hubris to try to get three machines working at once. They didn't have a chance.

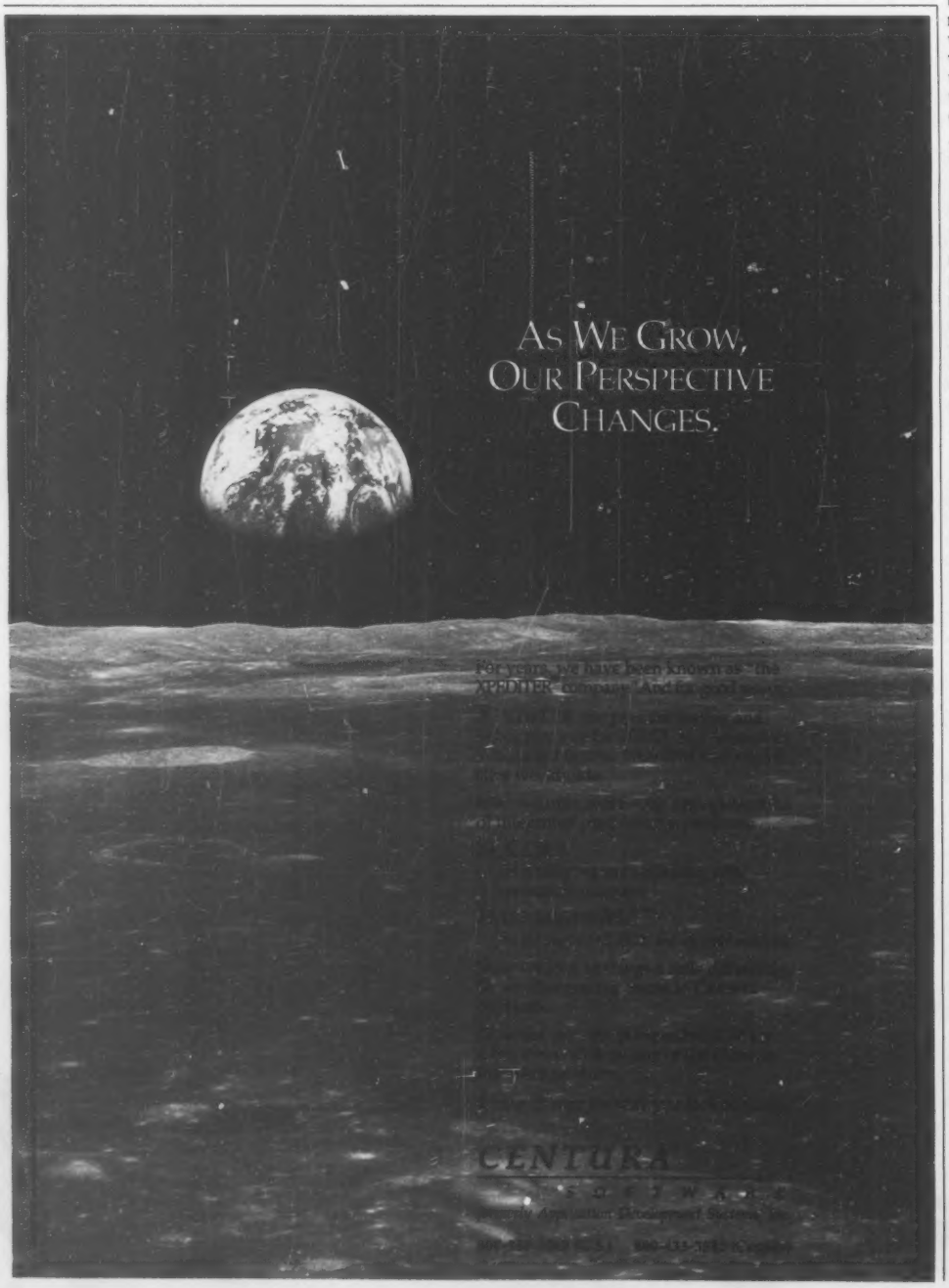
Consider the irony of it all. Here we stand on the threshold of the networked universe, where in 15 seconds an ATM in San Francisco can access my bank's mainframe in Boston, search multiple databases for account balance information and spit out $200 while updating my accounts and also shutting off any further withdrawals from said accounts from thousands of other ATMs across the country.

But all the money I can withdraw from all the ATMs in the world can't guarantee that the slide projector will work, even if the room is filled with technology gurus. We gather to discuss technology's future and are stymied by technology past.

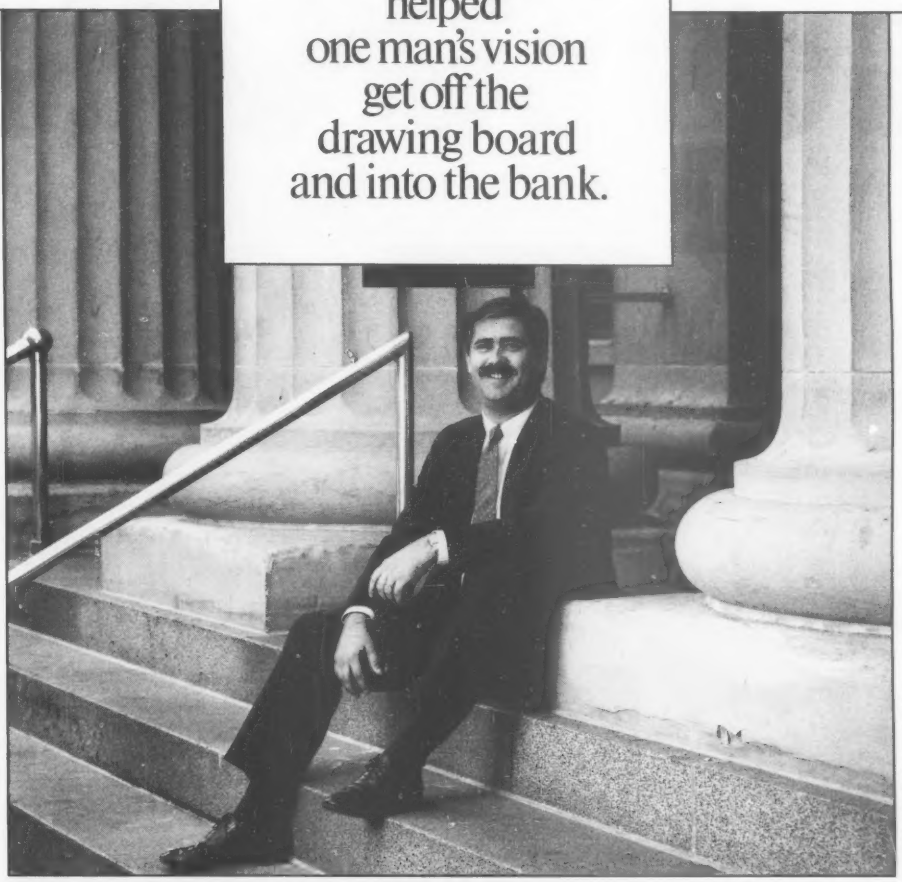
Kodak, are you listening? Sony, Canon, Panasonic, want to make a *really* big splash in the electronics market?

In the words of Peter Finch's character in the movie *Network*, 'I'm mad as hell, and I'm not going to take it anymore!' I just wish I knew what to do. Any and all suggestions are welcome.

Laberis is *Computerworld's* editor in chief



How ComputerLand® helped one man's vision get off the drawing board and into the bank.



Dan Bye, General Manager, Ask-Me Information Center, Minot, North Dakota

Envisioning an interactive videotex system that handles two-way communication and provides information to both users and management is unusual. Getting it up and running in under a year is unheard of. But after signing a contract with a major international bank, it's the kind of story that software developer Dan Bye can tell.

"When you're building a technically oriented company, you have to make the right choices right off the bat," says Dan. "That's why we went with ComputerLand. Ed Steckler (owner and store manager) personally took a major interest in our company. He was the obvious choice."

"AST® hardware and ComputerLand service brought the whole thing into place."

Dan Bye

The AST Premium 386SX/16 and the Bravo/286.

Searching for a system capable of utilizing every scrap of RAM and ROM, Dan considered several brand-name computers. Ed suggested AST for their technical innovation and quality, and arranged for Dan to tour the AST facility in Los Angeles. "The way they treated us, the way they did their business, everything they did was impressive," says Dan. "We have a very strong comfort level with them as a company as well as with their product."

As for service, "We looked at a variety of service vendors, and the ComputerLand Service Protection Plan really offered a lot."

For Dan, making the right choices has paid off.

ComputerLand®

AST® RESEARCH INC.

Business to business. Person to person.

© 1989 ComputerLand. AST and AST logo are registered trademarks of AST Research, Inc.

EUNUCHS

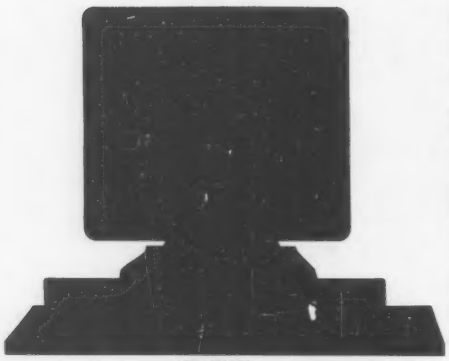
SUN

No POSIX compliance

No symmetric multiprocessing

No commercial-grade file system

No system under $700/MIPS



DEC

No symmetric multiprocessing currently available

No system under $700/MIPS

No multi-vendor binary compatibility

No open I/O bus across product line

HP

No RISC system under $1000/MIPS

No single compatible RISC architecture

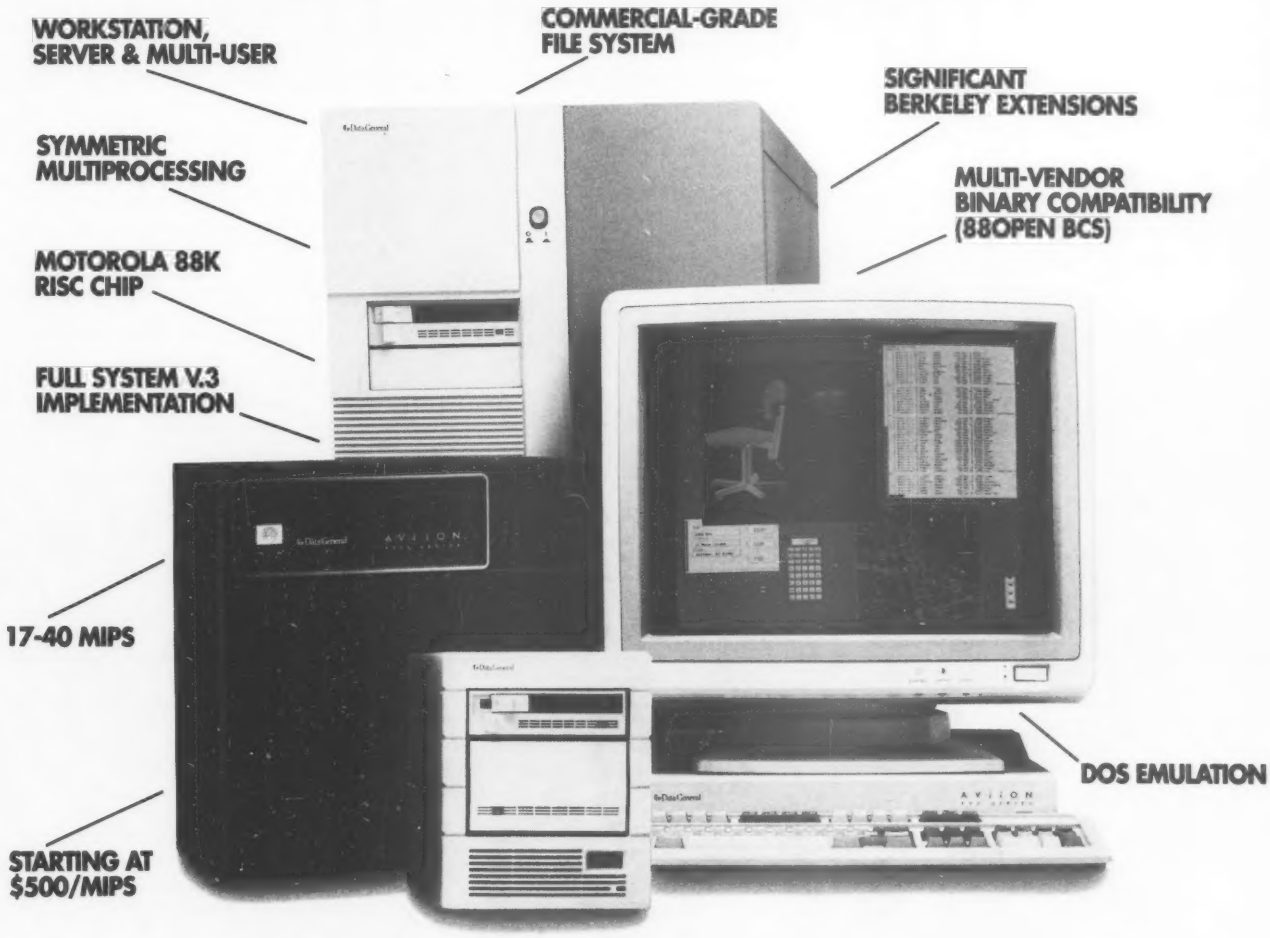
No POSIX compliance

No desktop RISC system

AViiON and DG/UX are trademarks of Data General.
UNIX is a registered trademark of AT&T.
OSF/Motif is a trademark of the Open Software Foundation.
NFS is a trademark of Sun Microsystems.
©1989 Data General Corporation.

The above comparative product data is based on industry newsletters, industry analyst information, vendor price lists, vendor advertising material, and other material available as of September 7, 1989. For a listing of information sources, please write Advertising, M.S. 9/3, Data General Corporation, 3400 Computer Drive, Westboro, MA 01580.

VS. UNIX



Data General's new AViiON Family.

Data General's new AViiON™ Family and the DG/UX™ operating system give UNIX® users what no "Eunuchs" system can: more openness, more value-added.

Our RISC-based AViiON Family's advanced implementation of UNIX supports standards like System V.3, POSIX, Berkeley, ANSI C, 88open BCS, NFS™, TCP/IP, IBM SNA, VME, X-Windows, OSF/Motif™ and more.

And we've engineered advanced commercial-grade features into DG/UX, such as a highly reliable file system, fully symmetric multiprocessing, and process scheduling that supports large user counts. What's more, you can take advantage of these important features without modifying your application, because DG/UX added value is transparent to the application.

But don't take our word for it. Call 1-800-DATAGEN today and we'll send you a free copy of "What the Experts say about Data General's UNIX based RISC Family." Or write to:

Data General
3400 Computer Drive, Westboro, MA 01580

FOR YOUR FREE "WHAT THE EXPERTS SAY" BOOKLET, CALL 1-800-DATAGEN.

Get your DB2 application development off and running with FOCUS.

FOCUS is the most widely used fourth generation language for DB2*. Whether you're writing reports, analyzing data, or building complete applications, FOCUS makes you ten times more productive than any other DB2 development aid.

COMPLETE APPLICATION DEVELOPMENT FACILITIES

FOCUS comes with a complete development tool set ready to work with DB2. In addition to code generators, editors, and visually-oriented screen and window painters for automating the development process, the FOCUS language gives you a complete array of programming constructs to complete your application without having to rely on COBOL or other 3GLs. And you can invoke specific DB2 commands from within FOCUS—such as COMMIT/ROLLBACK or GRANT/REVOKE security privileges.

SQL COMPATIBLE

Applications written in FOCUS automatically generate optimized SQL syntax for reading and updating DB2 databases—so you don't need to know SQL to work with DB2 tables. You can even embed SQL commands within FOCUS code or issue them directly during interactive FOCUS sessions. And if you want to use SQL against non-relational databases, FOCUS allows for that too.

DATA ACCESS AND CONVERSION TO DB2

FOCUS allows you to access every data structure on your mainframe—permitting you to convert to DB2 databases directly from any other database. And the FOCUS multi-field join capability allows you to link FOCUS, IMS, VSAM, or any other databases to DB2 for reporting and decision support. You can even give VM users access to DB2 data through our unique FOCNET/Cross Machine Interface.

For more information on how FOCUS can help you get your DB2 applications out of the gate fast, call Information Builders, Inc., at **(212) 736-4433,** Ext. 3700.

FOCUS
Information Builders, Inc.

* Computer Intelligence, 1989. This advertisement refers to numerous software products by their trade names. In most, if not all cases, these designations are claimed as trademarks or registered trademarks by their respective companies.

STOP SHAKING THE PAPER!
YOU'RE IN MY LIGHT.
WILL EVERYONE PLEASE READ TO THEMSELVES?!
BACK UP! BACK UP!
MOVE YOUR THUMB!
WAAIT, I'M NOT DONE!
SOMEBODY RIP OUT THE LETTERS SECTION FOR ME.
COMPUTERWORLD

YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $44.00* per year — a savings of 57% off the single copy price. In addition, I'll receive special bonus sections of COMPUTERWORLD Focus on Integration.

First Name MI Last Name

Title Company

Address

City State Zip

Address shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: $48 per year

*U.S. Only. Canada $110, Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. **BUSINESS/INDUSTRY** (Circle one)
   - **10.** Manufacturer (other than computer)
   - **20.** Finance/Insurance/Real Estate
   - **30.** Medicine/Law/Education
   - **40.** Wholesale/Retail/Trade
   - **50.** Business Service (except DP)
   - **60.** Government - State/Federal/Local
   - **65.** Communications Systems/Public Utilities/ Transportation
   - **70.** Mining/Construction/Petroleum/Refining/Agric.
   - **80.** Manufacturer of Computers, Computer-Related Systems or Peripherals
   - **85.** System Integrators, VARS, Computer Service Bureaus, Software Planning & Consulting Services
   - **90.** Computer/Peripheral Dealer/Distr./Retailer
   - **75.** User: Other _____
   - **95.** Vendor: Other _____ (Please specify)
2. **TITLE/FUNCTION** (Circle one)
   IS/MIS/DP MANAGEMENT
   - **19.** Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Mgt.
   - **21.** Dir./Mgr. MIS Services, Information Center
   - **22.** Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; Dir./Mgr. PC Resources
   - **23.** Dir./Mgr. Sys. Development, Sys. Architecture
   - **31.** Mgrs., Supry. of Programming, Software Dev.
   - **32.** Programmers, Software Developers

   OTHER COMPANY MANAGEMENT
   - **11.** President, Owner/Partner, General Mgr.
   - **12.** Vice President, Asst. VP
   - **13.** Treasurer, Controller, Financial Officer
   - **41.** Engineering, Scientific, R&D, Tech. Mgt.
   - **51.** Sales & Mktg. Mgt.

   OTHER PROFESSIONALS
   - **60.** Sys. Integrators/VARs/Consulting Mgt.
   - **70.** Medical, Legal, Accounting Mgt.
   - **80.** Educator, Journalists, Librarians, Students
   - **90.** Others _____ (Please specify)
3. **COMPUTER INVOLVEMENT** (Circle all that apply)
   Types of equipment with which you are personally involved either as a user, vendor, or consultant.
   - **A.** Mainframes/Superminis
   - **B.** Minicomputers/Small Business Computers
   - **C.** Microcomputers/Desktops
   - **D.** Communications Systems
   - **E.** Office Automation Systems
   - **F** No Computer Involvement

E4947-9

STOP SHAKING THE PAPER!
YOU'RE IN MY LIGHT.
WILL EVERYONE PLEASE READ TO THEMSELVES?!
BACK UP! BACK UP!
MOVE YOUR THUMB!
WAAIT, I'M NOT DONE!
SOMEBODY RIP OUT THE LETTERS SECTION FOR ME.
COMPUTERWORLD

YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $44.00* per year — a savings of 57% off the single copy price. In addition, I'll receive special bonus sections of COMPUTERWORLD Focus on Integration.

First Name MI Last Name

Title Company

Address

City State Zip

Address shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: $48 per year

*U.S. Only. Canada $110, Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. **BUSINESS/INDUSTRY** (Circle one)
   - **10.** Manufacturer (other than computer)
   - **20.** Finance/Insurance/Real Estate
   - **30.** Medicine/Law/Education
   - **40.** Wholesale/Retail/Trade
   - **50.** Business Service (except DP)
   - **60.** Government - State/Federal/Local
   - **65.** Communications Systems/Public Utilities/ Transportation
   - **70.** Mining/Construction/Petroleum/Refining/Agric.
   - **80.** Manufacturer of Computers, Computer-Related Systems or Peripherals
   - **85.** System Integrators, VARS, Computer Service Bureaus, Software Planning & Consulting Services
   - **90.** Computer/Peripheral Dealer/Distr./Retailer
   - **75.** User: Other _____
   - **95.** Vendor: Other _____ (Please specify)
2. **TITLE/FUNCTION** (Circle one)
   IS/MIS/DP MANAGEMENT
   - **19.** Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Mgt.
   - **21.** Dir./Mgr. MIS Services, Information Center
   - **22.** Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; Dir./Mgr. PC Resources
   - **23.** Dir./Mgr. Sys. Development, Sys. Architecture
   - **31.** Mgrs., Supry. of Programming, Software Dev.
   - **32.** Programmers, Software Developers

   OTHER COMPANY MANAGEMENT
   - **11.** President, Owner/Partner, General Mgr.
   - **12.** Vice President, Asst. VP
   - **13.** Treasurer, Controller, Financial Officer
   - **41.** Engineering, Scientific, R&D, Tech. Mgt.
   - **51.** Sales & Mktg. Mgt.

   OTHER PROFESSIONALS
   - **60.** Sys. Integrators/VARs/Consulting Mgt.
   - **70.** Medical, Legal, Accounting Mgt.
   - **80.** Educator, Journalists, Librarians, Students
   - **90.** Others _____ (Please specify)
3. **COMPUTER INVOLVEMENT** (Circle all that apply)
   Types of equipment with which you are personally involved either as a user, vendor, or consultant.
   - **A.** Mainframes/Superminis
   - **B.** Minicomputers/Small Business Computers
   - **C.** Microcomputers/Desktops
   - **D.** Communications Systems
   - **E.** Office Automation Systems
   - **F** No Computer Involvement

E4947-9

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

SOFT TALK

Greg Boone

CASE's next step: Process

Computer-aided software engineering (CASE) will evolve in the 1990s into a software engineering environment that will be planned, predictable and more closely matched to real business needs.

Today's emphasis in software engineering is on the efficiency and speed of producing a computer solution. In the future, more emphasis will be placed on the effectiveness of a computer solution — on building the right system for the corporation.

As yet, however, few people agree on what engineering really means in the context of software development.

Knowledge of methods must accompany the use of CASE tools. Such methods as data-flow diagramming or entity/relationship modeling have been in existence for more than 15 years, but the tedium of their application has limited their use.

Now that the minutiae of applying these methods has been removed through CASE technology, organizational and cultural inertia are the chief challenges to the adoption of CASE. The rigor and discipline that ac-

Continued on page 45

DBMS players seek key to distributed puzzle

ANALYSIS

BY JEAN S. BOZMAN
CW STAFF

The community of relational database • management system makers is trying to push distributed database technology off the drawing boards and into real-life applications. But one major stumbling block remains: the inability of multiple RDBMSs to update one another in real time.

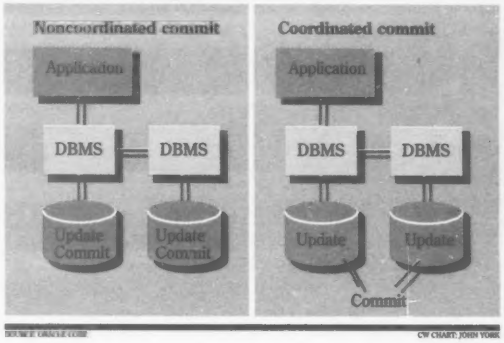
The solution, called two-phase commit technology, has been known for years, but making it work in real time — and over long-distance networks — remains a troublesome problem. In recent weeks, however, a number of vendors, including Oracle Corp., Ingres Corp. and Informix Software, Inc., have outlined plans to bring two-phase commit features to the market.

Others, such as Digital Equipment Corp. and IBM, say they are working on perfecting the technology. A select few, including Tandem Computer, Inc. and Sybase, Inc., say they have been providing two-phase commit for some time. Ingres claims to support two-phase commit in its new Release 6.3, shipping this month. Others, including Oracle, are aiming at full two-phase commit for their next release but are providing distributed query

Continued on page 44

Coordinated commit

Under two-phase or coordinated commits, the integrity of each database is ensured by simultaneous updates



CW CHART: JOHN YORK

Mulling minicomputers in the data center

BY J. A. SAVAGE
CW STAFF

Data center managers now have more choice in mainframe architecture. They can choose lower-cost hardware in a non-IBM environment and spend wads of money on creating software applications, or they can stay with the IBM 370 architecture, spending millions on hardware but less on software.

With the recent entry of three computer companies best known for their minicomputers and one company best known for huge mainframes into the non-IBM compatible mainframe market, information systems managers do have more of a choice. But does saving money on hardware make the choice more palatable?

Digital Equipment Corp. and Tandem Computers, Inc. recently introduced mainframes that use their proprietary operating systems. With their eyes on the data center, Mips Computer Systems, Inc. and Amdahl Corp. — normally an IBM plug-compatible vendor — both unveiled Unix-based systems.

Despite the reliability of the equipment or the breadth — or lack thereof — of the operating system, it is almost impossible for an IS director to invest in a low-priced computer after spending millions on 370 architecture mainframes. It would be cutting one's throat along with the IS budget, analysts said.

Aside from tradition and budgetary considerations, minicomputer software has yet to lend itself to mainframe-type applications, not to mention the cost of migration.

Amdahl's surprising move into the field of Unix-dedicated mainframes may have been a signal that traditional mainframe vendors see an opportunity outside the parameters drawn by IBM. Unlike the other newcomers, the company has priced its mainframes at about the same levels as current IBM low-end mainframes.

Amdahl expects its first customers to come from the telecommunications industry and has had a long relationship with AT&T, which runs Amdahl's Unix version on the company's 370 architecture mainframes.

As a reduced instruction set computing minicomputer maker, Mips has a reputation for fast hardware. According to Bonnie Digrius, an analyst at Infocorp, its Unix mainframe, priced well below IBM entry-level mainframes, may go fast, but where is it going? Digrius said that the software for mainframe applications has not caught up with "whizzy boxes."

Continued on page 40

Inside

- 3M sticks to plan for adopting new technology. Page 35.
- Beta-test users boost Interbase Version 3.0. Page 35.
- Unix cannot live by GUI alone. Page 38.

TAKE THE ***FAST TRACK*** TO ZERO DEFECT PRODUCTION CONTROL – AND UNATTENDED OPERATIONS.

For MVS, MVS/XA and MVS/ESA environments

You don't have to wait for the increased savings and productivity of zero defect production control and unattended operations. The BETA 91, 92 and 93 software solutions are already delivering powerful, easy-to-use error detection and prevention to more than 300 MVS installations.

BETA 91 automates virtually any batch verification or restart procedure. This eliminates manual balancing and other output checking to speed processing, reduce the risk of errors, and save printing and paper costs. With BETA 91, you can also halt processing as soon as errors are detected and avoid costly manhours.

BETA 92 delivers efficient on-line SYSOUT control, archival, and retrieval, managing all job output in its own compressed on-line databases. It enables convenient on-line browsing of JCL, SYSLOG JES, and other listings. You no longer have the costs and headaches of manual archival and retrieval, and you can always find SYSOUT quickly—even from jobs that ran months ago.

BETA 93 automates the separation, packaging, distribution, and archiving of printed reports. It eliminates labor-intensive, error-prone manual postprocessing tasks to save manhours, money, and time. BETA 93's unique multi-level distribution definitions let it tackle the most complex reporting environments, ensuring fast, reliable distribution to all users.

■ ***YES, tell me more about BETA Systems Software:***

☐ All three systems
☐ BETA 91 – Automated Balancing & Quality Management System
☐ BETA 92 – Job History & Output Management System
☐ BETA 93 – Report Distribution & Print Management System

NAME _____ TITLE _____
COMPANY _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____
TELEPHONE _____
CPU MAKE/MODEL _____
OP. SYS. _____

BETA Systems Software, Inc.

111 Anza Blvd. ■ Suite 412 ■ Burlingame, CA 94010 ■ (415) 344-4014

This Is What The NeXT Computer Looks Like Close Up. Come To Businessland And Get Even Closer.

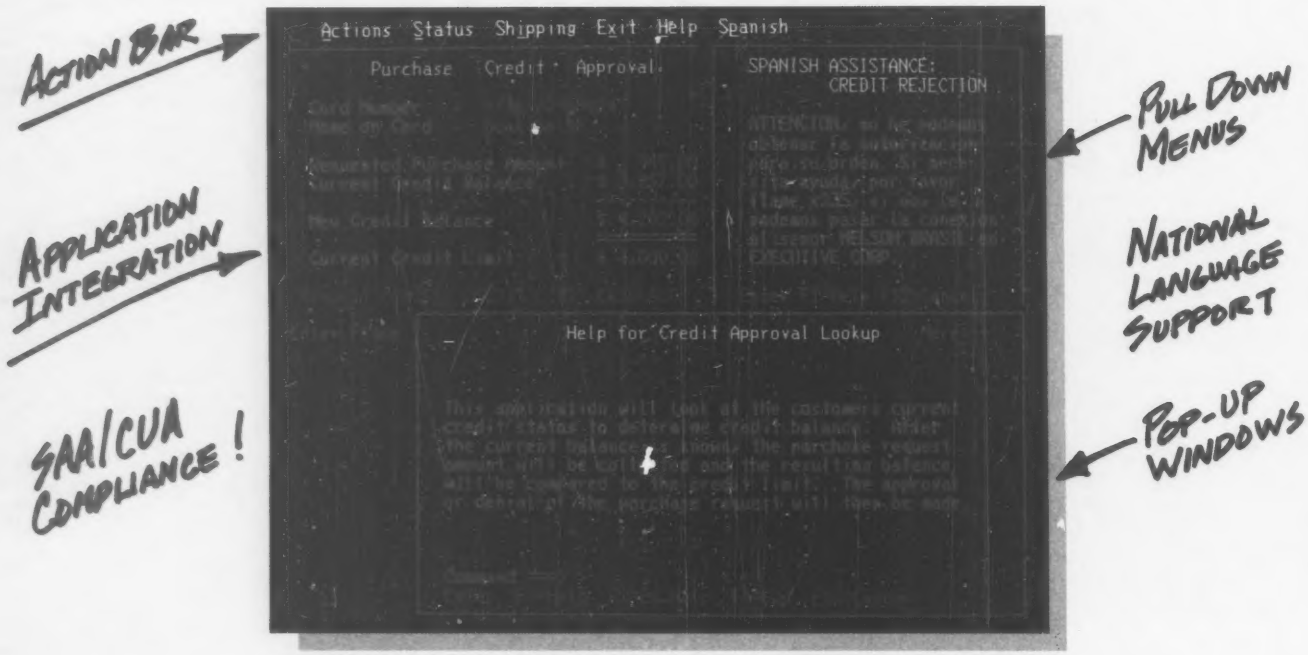
Not only do we have the NeXT™ system on display, but we're also offering NeXT Workstation Publishing Seminars nationwide to acquaint you with the remarkable advances of this new computer. For dates and times, call 1 800 328 8383 or your nearest Businessland center.

BUSINESSLAND

A Different Kind of Computer Company.

Businessland is a registered trademark of Businessland Inc.
NeXT is a trademark of NeXT Inc. ©1989 Businessland Inc.

Transform your 3270 into a powerful SAA/CUA workstation.



CL/SUPERSESSION exploits SAA/CUA innovations for easier application integration so you can blend data from multiple applications without changing source code.

Does your 3270 make you feel like the SAA/CUA parade is passing you by...and that colorful pop-up windows, pulldown menus, and action bars are just names on a wish list?

Candle's CL/SUPERSESSION® can change all that - plus give you fast and flexible application front-ending. Or even the ability to integrate old CICS or IMS applications into new DB2 ones.

It's the *only* network productivity tool that can accomplish all this because it's the only one that's SAA/CUA-compliant. CL/SUPERSESSION's handy pop-up windows simplify even the trickiest application integration. And it supports your global network by letting you customize application front ends in different languages, including French, Italian, and German. You can also create Help screens in the appropriate language.

CL/SUPERSESSION is backed by Candle's unique Network Service Center support - a team of specialists whose mission is to make your life easier by providing fast answers to your networking questions.

CL/SUPERSESSION from Candle. Now every VTAM terminal on your network can have the zest of SAA/CUA with workstation-style productivity. For details, call us today at **(312) 954-3888** (in Illinois) or **(800) 762-7608** (outside Illinois).

!Candle®

Copyright © 1989 Candle Corporation.
All Rights Reserved.

3M watches, waits and moves

ON SITE

BY J. A. SAVAGE
CW STAFF

ST. PAUL, Minn. — Chuck Anastasi refers to his department's unserious edict — 3M Co. wants to be six months behind the leading edge — to explain that the $10 billion company is serious about adopting new technology.

The company does not rush in to buy the newest technology but tries instead to move ahead with it after careful examination. The firm maintains a balancing act between recognizing the right time to move ahead with technology and how to stay with centralized processing and standard-setting while integrating technology into the business plans of its 50 business units — the tape makers, the Post-it manufacturers and others.

The major avenue used to identify costs and benefits in departments has been through a restructuring of internal planning processes. Planning requirements have led to elevating the importance of technology to top management, according to Anastasi. For instance, an Information Steering Committee was created as a subcommittee of the company's Management Committee. Information systems has also recently become instrinsic to each unit's business plans.

Anastasi, who is the director of technology, said there are no formal rules for acquisition of technology, only that it has to pass a thorough cost-benefit analysis before he can get funding. For instance, it could be as time-consuming as the homework done before acquiring Storage Technology Corp.'s automated libraries, or as matter-of-fact as deciding to install IBM's latest operating system.

After visiting Storage Tek's beta-test site customers, who were dealing with 3M's human resources officials over displacing tape management staff and the requisite budgeting process, eight automated libraries were installed. That research, according to Anastasi, was more than what is normally necessary, but the personnel issues required it in that case.

On the other hand, deciding to migrate to IBM's MVS/ESA operating system on the company's seven IBM mainframes — which include 3090s and 4381s — entailed more logic than homework. It was the only way to grow. "You're going to get to the point where all the new hardware releases will require it; you're going to limit yourself if you don't have it," he said.

Despite the inevitability of technology getting into the hands of users far removed from the data center in St. Paul, 3M remains fairly centralized.

There are about 1,100 IS personnel in the divisions and another 900 in St. Paul. Given that autonomy, "3M is very central when it comes to computing," Anastasi said. "Every invoice, every payroll check goes through central computing."

While 3M demands a central voice in IS, it does give its manufacturing facilities some leeway in technology. However, if it is not an IBM Personal Computer or clone, or if it is a communications system not supported by the central office, users are on their own. "They still have that right [to buy equipment not sanctioned by 3M]. There are no edicts. But if a business unit chooses to deviate, they'll get wise," Anastasi said.

For instance, the standard Unix operating system crept up on the company.

On the manufacturing floor, 3M runs Hewlett-Packard Co.'s Unix-based minicomputers, the HP 9000 series, which feed data to the HP 3000 reduced instruction set computing machines on the business side. Although the shop floors have had Unix machines for about two years, 3M has supported them through the central IS group only since the middle of this year, after many user requests, according to Marsh Brough, manager of distributed technical services. His staff is still shorthanded with a Unix support staff of one. He expects to add two more people.

Departmental computing usually gets its start through time-sharing at the main data center with seven or more VM-based mainframes ranging from 9370s to 3081s — in addition to those in the core data center. The company also has 22 Digital Equipment Corp. VAXs for departmental computing.

"We're not on a mission to wean them off the data center but to help make the best economic decisions," Anastasi said. He added that IS helps the departments decide whether it is more cost-effective to pay time-sharing rates or to pay software licenses and then pay the IS department for support.

Interbase unleashes critical functionality

BY ROBERT MORAN
CW STAFF

Beta-test users of Version 3.0 of Interbase Software Corp.'s relational database management system, Interbase, said that the company has delivered critical functionality that programmers have previously had to embed within applications.

The new release, according to the company, has moved commonly called functions, business rules and semantic information out of the application code into the database kernel.

With Version 3.0, which will be generally available by the beginning of January, the company introduced the following:

- Event alerters, which signal programs that a change has been made and a transaction committed.
- Array support, the ability to store collections of related data, which eliminates the need to jerry-build solutions with two-dimensional records.
- Basic large object, or blob, filters, which permit the storage of text, images, and digitized voice, and eliminate the need for code to translate the typically unstructured data from application to application.
- User-defined functions, which permit programmers to define functions specific to the organization and associate them with the database rather than with applications, eliminating redundancy in application code.

Beta-test user David Hoffman, vice-president of engineering at Team One Systems, Inc. in Santa Clara, Calif., uses Interbase as a repository for engineering and manufacturing data. Hoffman said Version 3.0 brings him "the ability to configure my systems in either peer-to-peer configurations or as file servers without having to change applications."

In addition, he said, the event alerts will help with the company's bug-tracking system. "Users can now be notified immediately that the file has been checked out," he said. "It wasn't possible before because polling from all different workstations was impractical."

Beta-test user Mat Bays, a staff engineer at the Analog Semiconductor Division of National Semiconductor Corp., runs Interbase on a 30-node network of Apollo Computer workstations in an application that collects and stores millions of test results on the company's printed circuits. Bays said Version 3.0 increased performance between 10% and 50%.

Math master

The application requires intensive mathematical calculations, which under Version 2.0 had to be performed outside of the database. "With user-defined functions, we can now do that directly," Bays said.

Further, the staff constantly combs through the data, looking for abnormalities.

'With the event-driven feature," Bays said, "we can send an alarm to someone at a workstation to notify them of a problem."

Version 3.0 runs on Unix-based systems from Hewlett-Packard Co., Digital Equipment Corp. andSun Microsystems, Inc., and DEC VMS systems. Prices range from $5,000 to $100,000.

For IBM 3270, S/36/38, and AS/400 Users:

100% IBM 4224 Compatible!

Available Now!

With our plug-compatible ISI 7224 desktop dot matrix printers, you can print everything an IBM 4224 can print...and more.

7224

We offer 200 cps and 400 cps models. Each prints high-resolution graphics, bar codes, and oversize characters with full IPDS support...now! Plus, our easy-to-use Escape Language lets you perform these advanced printing functions without GDDM, BGU, or other special software.

With an ISI 7224, you can switch instantly from continuous forms to cut sheets, then back to continuous, without reloading or losing the top-of-form position. You also get no-waste demand-document tear-off without extra cost gadgets. Forms can have up to six parts.

Fully integrated, our ISI 7224 printers connect directly to your IBM systems — just plug them in and print.

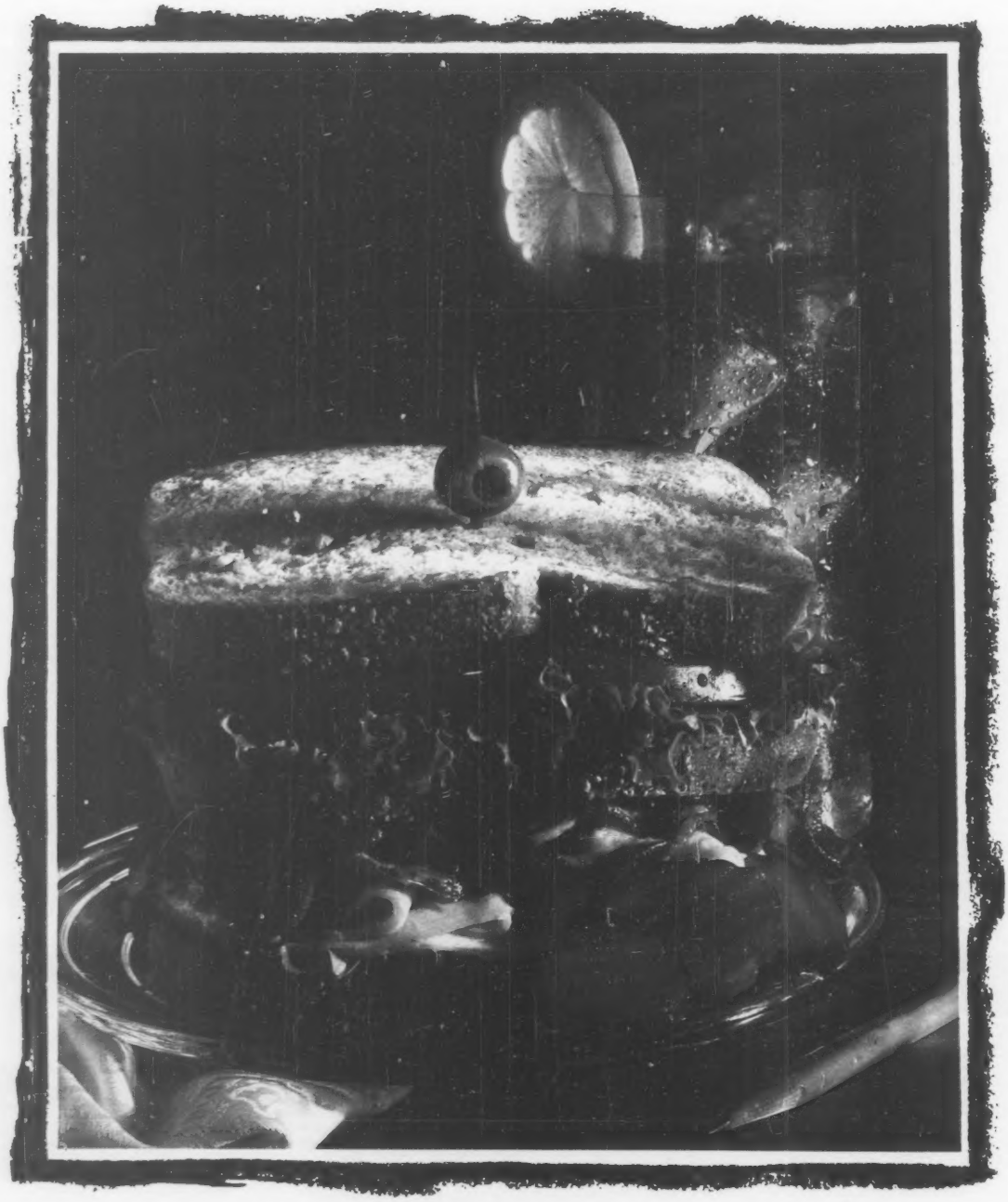
Extra features and all, our ISI 7224 printers cost much less than their IBM counterparts.

For more information, call 1-800-544-4072 (in Michigan, 313/769-5900).

Interface Systems, Inc.
Printer Solutions for IBM Systems
5855 Interface Drive, Ann Arbor, MI 48103
Telex: 810-223-6058, FAX: 313/769-1047

▶ Our ISI 7224-X01 is a compact, economical 200 cps model.

▶ Our high-speed ISI 7224-XX2 prints at 400 cps in up to eight colors.



PS/2 is a registered trademark of International Business Machines Corporation. © 1989 IBM Corp.

The least a local area network can give you is time for lunch.

Some food for thought.

Getting all the information from all your equipment to all your people can occupy all your time.

That's where the IBM Token-Ring Network can help.

With our new 16-megabit bandwidth, it provides remarkable new speed in moving everything from bulk data to mail to graphic images.

IBM's Token-Ring Network fits into most existing environments. It's compatible with today's popular software, connecting your workstations, including PCs and PS/2s,® midrange computers, mainframes and peripherals.

We've also designed it for reliability. With IBM software, it's easy to diagnose, isolate and correct problems, without affecting the rest of your network.

It's another reason why no other company connects more companies with more equipment to more people than IBM.

For more information on IBM local area network solutions, contact your local IBM Advanced Product Dealer or your IBM marketing representative.

We can help your entire organization run more smoothly and productively. And that means you can devote your time to other important matters.

Bon appétit.

IBM®

Graphical interface tools edge into scene

BY AMY CORTESE
CW STAFF

Graphical user interfaces (GUI) promise to bring the intuitive presentation pioneered by the Apple Computer, Inc. Macintosh to environments that are currently largely character-based. That idea has received endorsements from a wide range of observers on both the user and vendor sides of the industry.

One of the areas with the greatest potential is Unix systems, which are notorious for their intimidating syntax. But GUIs alone are not a solution, according to observers. Tools and applications are needed to let users take advantage of the graphical abilities. Those products, like the GUIs they work with, are gradually starting to appear.

For instance, while AT&T's Open Look provides a barebones desktop manager to help users with basic tasks such as traveling through their files, Open Software Foundation's Motif does not include this kind of feature.

"Motif means that there is a window manager and a tool kit that developers can use to build applications, but no user-visible tools," according to Alan Atlas, vice-president of engineering at Visix Software, Inc. and former manager of development at the OSF.

Name that category

A new category of software tools and applications that extend and enhance the functionality provided by GUIs is cropping up, as was apparent at the recent Unix Expo last month.

One category of software is the desktop manager or graphical shell. End users will be able to run applications that use Motif or other GUIs as these applications start reaching the market, but many may find they need a shell or desktop manager to keep track of them.

Visix recently introduced Looking Glass, a graphical shell for Unix systems that will begin shipping this month for major Unix platforms. A graphical shell simplifies the daunting task of interfacing to the Unix operating system, and it generally sits on top of a GUI.

While it requires only X Window System, Looking Glass adopts the Motif behavior and three-dimensional look.

IXI Limited, based in Cambridge, England, unveiled Version 2.0 of X.desktop, its desktop manager application. The new version uses the OSF/Motif tool kit and provides Motif's 3-D look and feel.

Separately, Motorola's Microcomputer Division announced it has selected X.desktop as the standard desktop manager program for the Unix-based Delta series.

AT&T booster shot

In other developments, AT&T attempted to bolster support of Open Look with new and enhanced GUI products.

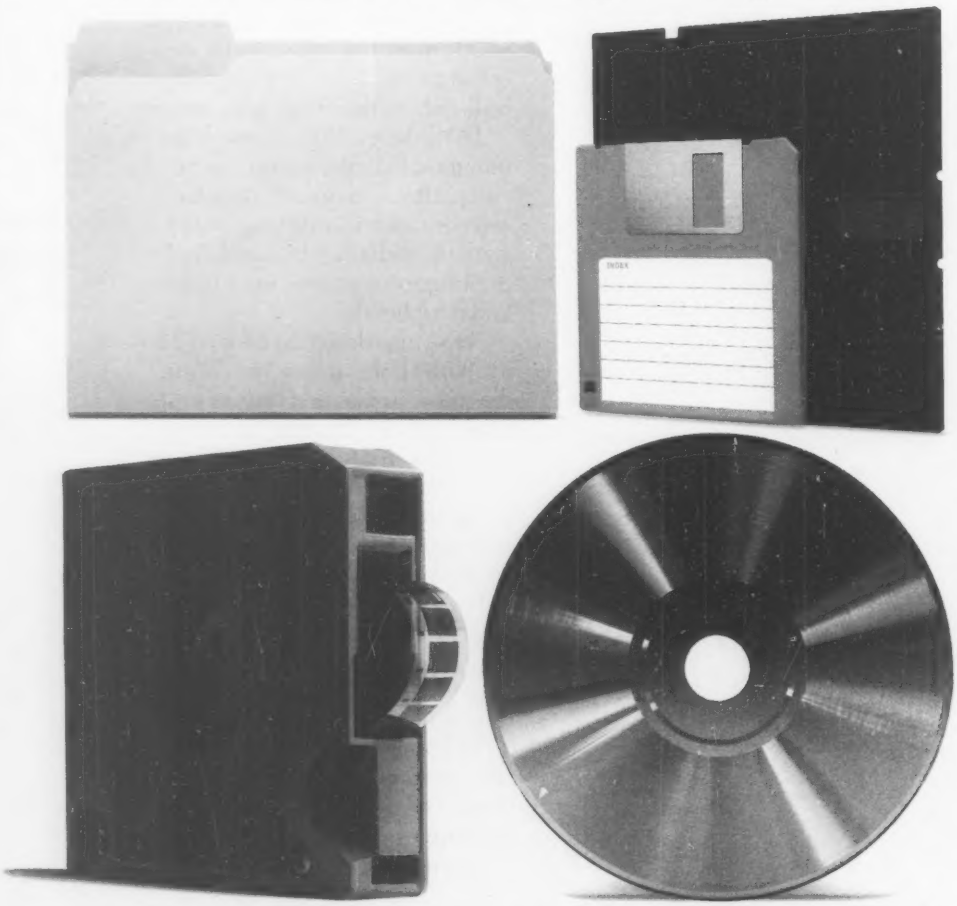
Open Look Express is a new user interface development tool designed to simplify development of applications that conform to Open Look specifications. A developer need not be an X Window expert to write applications for Open Look, according to AT&T.

For instance, using the new tool, developers can draw the interface rather than write code for it.

Additionally, AT&T announced enhancements to Open Look, including a faster performing release of the Open Look tool kit.

JYACC, Inc., an application development tool supplier based in New York, expanded support of its user interface tools to the Digital Equipment Corp. VAX environment. JAM, a user interface management system, and JAM/DBI, an interface to relational databases, can now be used to design and develop applications for DEC's RDB database management system.

This Software Can Organize Your Files, No Matter What Shape They're In.



No matter how you store your important documents, 3M Document Management Software (DMS) can help you manage those files more efficiently. Because unlike some automated filing systems, DMS can process paper, microfilm and digital files. And it will work even if you store your documents in more than one medium. Or convert from one storage medium to another. So you can plan for changes in your storage media more easily.

Another major benefit of 3M's DMS is that it makes efficient use of computer system resources. It does this by linking all related documents to a Master Record, which allows you to access files fast. DMS is also easy to install and implement. And simple to learn and use, because 3M tailors the software to your individual application.

3M has already installed DMS applications specifically tailored for Banking, Insurance, Manufacturing, and Accounting. And it's one of the only document management systems that will work with PC, Mini and Mainframe environments. So what are you waiting for? Start getting your filing system in shape today by calling the 3M Information Systems Group at 1-800-247-8516.

3M

A few words about the one piece of software that could kill your company.

Minis

FROM PAGE 31

"Cobol programs won't go easily to Tandem or DEC," Digrius said. "Tandem and DEC will slowly chip away at IBM's turf only for new applications."

"Bringing in a [new architecture] for new applications is a difficult way to perform a transition," said Bill Anderson, manager of technical services at Seattle First National Bank Corp. in Seattle. Anderson said he did that with IBM when the company decided to move from its Honeywell, Inc. machines in the mid-1980s. "With both architectures running, your staff has to be trained on both." He said that it may work with a "very specific, special-purpose" stand-alone, but that by itself, "big processing power doesn't buy you anything."

"I'm not saying we wouldn't go to Unix, but it's very unlikely because it really doesn't do the same thing," said Jim Franklin, vice-president of information systems at Crowley Maritime Corp. in San Francisco. "When Unix does the same thing as MVS, then maybe. Hardware is not the big question. It's the software." Crowley runs a high-end Hitachi Data Systems Corp. (formerly National Advanced Systems) mainframe.

However, in the same manner that personal computers creeped under the corporate IS department's wing, other architectures may slip into the data center through their adoption by departments.

Unix systems may move into the data center this way, according to Digrius. "If the departments are used to using Unix workstations, MIS realizes that they can't ram 370 architecture down their throats," she said. The traditional IS department may bring in a Unix mainframe for support. Having the centralized power still in the data center would "make MIS more comfortable," she said.

While DEC and Tandem have to convince customers of the efficacy of their proprietary operating systems at a mainframe level, Unix at least has the advantage of being perceived as the operating system of the future. That may leave a harder sell in the future for DEC and Tandem. According to a report by International Data Corp., saving money on Tandem hardware isn't enough. "IBM's customers are unlikely to initiate a major migration of existing software applications to [Tandem] for no other reason than to escape the cost of IBM hardware," IDC said. Perhaps government entities, which are more responsive to budget pressures, are likely candidates for new mainframe architectures, IDC said.

3090 USERS:

OVER 5 BILLION BYTES NOW INSTALLED!

INTRODUCING STOR/9000. YOUR TICKET TO ESA HAS JUST ARRIVED.

If you are like most 3090 users, you have begun to implement IBM's Enterprise Systems Architecture (ESA) operating environment or plan to soon.

And like most users, your ability to obtain the full benefits of ESA has been limited by the enormous memory requirements of both central and expanded storage.

Introducing STOR/9000, the supersaver memory system from Cambex that gives you up to 33 per cent more 3090 memory per dollar, so better DB2 and CICS performance under ESA can be yours right now.

STOR/9000 continues the Cambex tradition of IBM mainframe memory innovation that began five generations ago with the first System/360 add-on memory, and has made us the world's largest independent supplier of mainframe memory today.

STOR/9000: UNIQUE IN FIVE WAYS

Superior references. Our "move-with-care" product policy assures users that Cambex memory is well respected by leading users before we announce it broadly. STOR/9000 is performing superbly in over a dozen 3090 sites right now. Even the conservative Gartner Group has said "early reports...have been positive" after checking our users.

Superior design. The sophistication of STOR/9000 lies in its simplicity. It is card-for-card compatible -- and intermixable -- with IBM's own memory cards. It plugs right into IBM backplanes. It uses IBM diagnostics and reporting procedures. And it was designed to facilitate resale, reconfiguration and risk-free operation by every 3090 shop.

Advanced features. Cambex tries in little ways to offer users more functionality in its memories. STOR/9000 memory can be used in all 3090 models -- Base, E and S -- interchangeably. It uses faster memory chips. Because of its 100% card compatibility with IBM memory cards, STOR/9000 installs very quickly and easily. No one else can match these extras.

Advanced data protection. Twenty years of building products that operate within the core of a user's computing resource has taught us the importance of uncompromised data integrity. STOR/9000 Central Storage uses single-bit error correcting and double-bit error detecting. Our Expanded Storage uses double-bit error-correcting and triple-bit error detecting codes. There is no higher standard.

Comprehensive customer support. A product's value is greatly enhanced by the quality of the people, policies and programs that support it. Cambex's Value of Availability customer support program is the industry's most comprehensive -- and includes a unique "try before you buy" option that makes your first experience with STOR/9000 completely safe.

Find out more about the new STOR/9000. It can be your first-class supersaver ticket to the many advantages of the MVS/ESA operating environment.

For information, call Cambex at 1-800-325-5565, or send us the coupon.

CambeX

Where memory innovation began.
Where memory innovation continues.

Cambex Corporation
360 Second Avenue
Waltham, MA 02154
617-890-6000

Tell me more about STOR/9000 memory.
__ Send me the latest Gartner Group report on third-party 3090 memory
__ Send me your STOR/9000 SuperSaver information package
__ Send me a STOR/9000 customer reference list.

NAME:
TITLE:
DEPT:
ORGANIZATION:
STREET:
CITY:
STATE: ZIP:
PHONE:

ESA, 3090, DB2,CICS, System/360 and MVS are trademarks of IBM Corporation

SOFT NOTES

OSF narrows candidates on proposal list

The **Open Software Foundation** recently announced the candidates for two published requests for technology (RFT). Seventeen organizations, including **Hewlett-Packard Co.** and **Software Engineering Associates**, qualified for the architecture-neutral distribution format RFT, which would allow software applications to run on any architecture. An RFT for distributed computing technology drew 28 candidates.

UIS, the U.K.-based systems software vendor, announced that a new version of its V-X Pacs resource accounting and chargeback system for **Digital Equipment Corp.**'s VAX VMS environments has become part of DEC's Cooperative Marketing Program. Version 2.0 runs on all VAX systems, including the new 9000, and is priced from $1,750 to $16,000 for the multiprocessor 8000 series.

Natick Mass.-based **McCormack & Dodge Corp.** has extended its human resources software offerings with the addition of a flexible benefits package. HR:Millenium Flexible Benefits is available for IBM mainframes and 4300 series systems under OS/DOS and costs $35,000.

relational database blah blah blah blah benchmark scores like you wouldn't believe blah blah blah blah everybody's information management needs from you down to the janitor blah blah blah blah blah blah blah blah blah thousands of consultants 24 hours a day for the rest of your life blah blah blah blah blah blah blah blah blah technical gibberish blah blah blah blah blah blah vaporous promises blah blah blah blah blah custom tailored to fit everybody blah blah blah blah blah blah blah relational database blah blah blah the computing environment that redefines the 21st century blah blah blah blah blah blah post-state-of-the-art blah blah blah blah blah nanosecond response times blah blah blah blah blah runs on every platform in the known universe blah blah blah blah blah all's fair as long as you're not outright lying blah blah blah blah blah

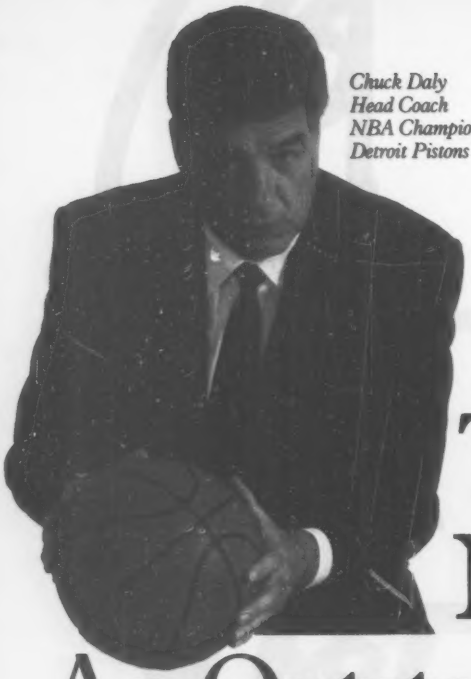
Enough.

Flatulent rhetoric and misleading tech-talk are not exactly a good basis for decision-making. Especially not when the subject is relational databases.

The next time you see an ad from Ingres, you'll finally see an alternative to gibberish, vapor and blah. Namely, real information about a more intelligent way to run your business. The Ingres Relational Database System. Stay tuned.

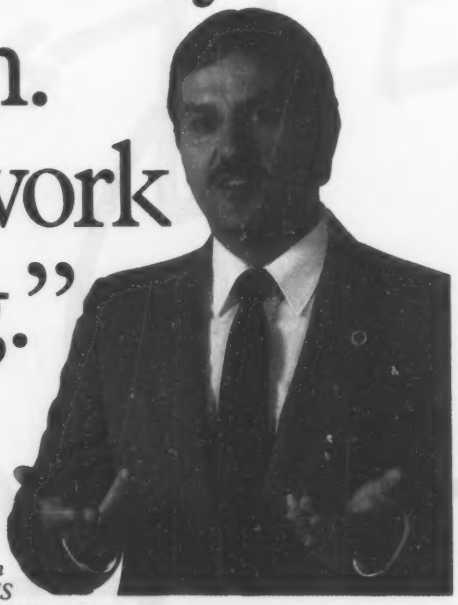
Ingres

© 1989 Ingres Corporation.



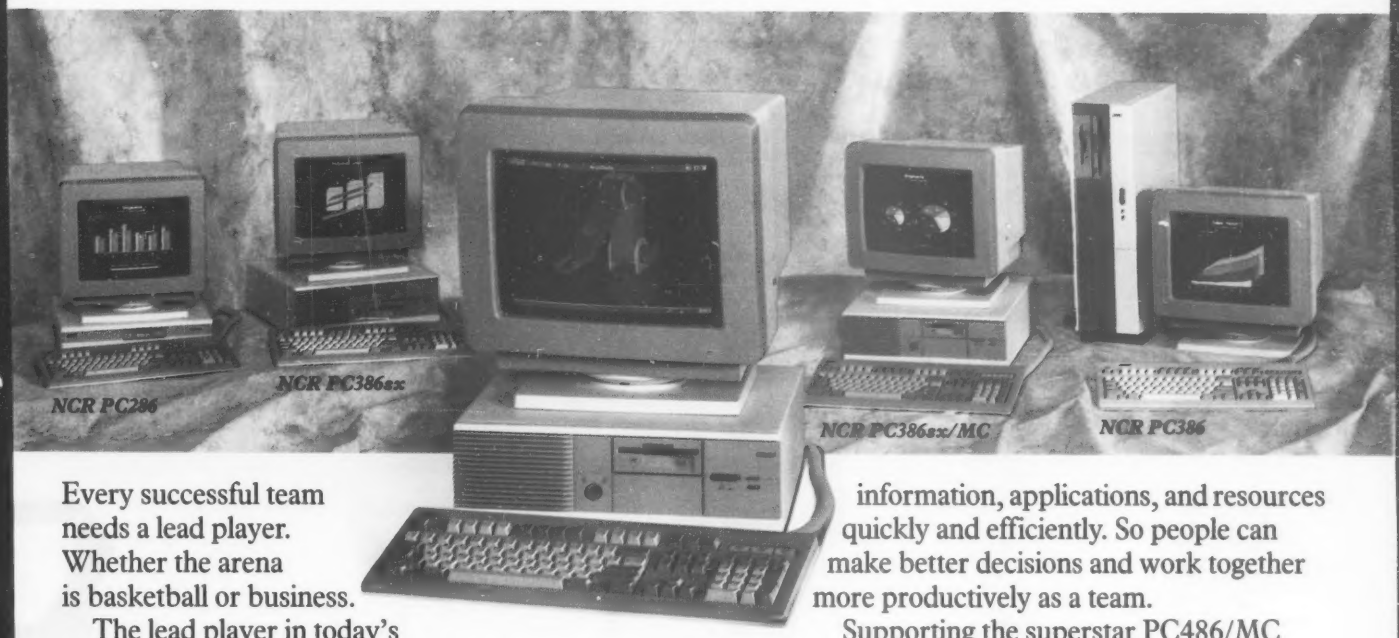
Chuck Daly
Head Coach
NBA Champions
Detroit Pistons

"In This League, The True Superstar Not Only Gives You An Outstanding Individual Performance, But Also Elevates The Play Of The Team. Because Teamwork Is Everything."



Bill Thompson
Director of MIS
The Sherwin-Williams Company
Paint Stores Group

Introducing The NCR PC486/MC.



Every successful team needs a lead player. Whether the arena is basketball or business.

The lead player in today's PC market is the new NCR PC486/MC, the personal computer designed for the power user.

The NCR PC486/MC sets a new standard in speed, performance, and productivity—combining a 25MHz Intel486™ microprocessor, Micro Channel™ Architecture, 128KB of high-speed cache memory (twice what you find on competitive models), a Small Computer System Interface (SCSI) controller, and SuperVGA graphics are standard.

This is a true multi-tasking personal computer. Ideal for large spreadsheets, extensive database management, financial modeling, artificial intelligence, networking, and more.

Importantly—you also have the choice of MS DOS®, OS/2™, and UNIX® operating systems.

Like all NCR personal computers, the PC486/MC is a team player, networking information, applications, and resources quickly and efficiently. So people can make better decisions and work together more productively as a team.

Supporting the superstar PC486/MC are the entry-level PC286 desktop and the ever-powerful PC386. Between them in our lineup are the PC386sx and the PC386sx/MC, two Intel386™SX-based personal computers that deliver significantly improved price/performance capabilities over Intel286™-based PCs.

NCR teamwork goes beyond hardware and software, providing dedicated service and support for a solutions approach always open to individual needs. Because that's the name of the game.

For a free literature packet on this new team of personal computers and the location of the Authorized NCR Reseller or sales representative nearest you, call **1 800 544-3333**. Or write to us at P.O. Box 2989, Norcross, Georgia 30091.

NCR PERSONAL COMPUTERS
Because Teamwork Is Everything

NCR

Creating value

NCR is the name and mark of NCR Corporation. 286, 386, and 486 are trademarks of Intel Corporation. MS and MS DOS are registered trademarks of Microsoft Corporation. Micro Channel and OS/2 are trademarks of IBM Corporation. UNIX is a registered trademark of AT&T Bell Laboratories. © 1989 NCR Corporation

RDBMS

FROM PAGE 31

against multiple DBMSs for now.

The two phases in two-phase commit amount to a "prepare" signal and a "commit" signal issued by an independent commit "coordinator" module that can communicate with all the DBMSs involved. The purpose of the two-part process is to ensure that every DBMS is ready to be updated — and that if anything goes wrong, they will not be updated at all.

In the event that a system or network failure prevents the updating of all DBMSs, the transaction is said to be "rolled back" to its previous state — that is, the transaction has to be attempted again. The two-phase commit process records the proposed update in "logs," or journals, within the DBMS so that data can be restored.

"Most vendors provide [the ability to do] a distributed read with a single-site update," said Dale Kutnick, president of Meta Group, Inc., a Westport, Conn., market research firm. "IBM already supports two-phase commit between the IMS and DB2 databases in a single machine running MVS. But by 1991, many vendors will have announced a two-phase commit capability that distributes work throughout a network."

By the mid-1990s, two-phase commit will be required for DBMS players, analysts and vendors agree. "What we have today is that an application program can connect to several copies of Oracle, or to any one of them," said Ken Jacobs, director of RDBMS marketing at Oracle.

"Having two-phase commit is a question of time," Jacobs said. "Different vendors have solved different parts of the distributed database puzzle."

Real-time applications such as banking and airline reservation systems will be among the first to demand distributed updates, vendors said. Even so, database designers will be able to control how much updating takes place between DBMSs. If they do not have that control, vendors warn, there will be dramatic performance drop-offs as network traffic escalates.

Two-phased

Some vendors, such as Sybase, are telling users to plan on performance trade-offs before they even write an RDBMS application that uses two-phase commit. Others say many users may sidestep the two-phase commit issue altogether because two-phase commit will not be needed for many DBMS applications. "You have to realize that, over a long-haul network, two-phase commit will guarantee that every transaction will run more slowly," said Gilbert Wai, director of product marketing at Informix.

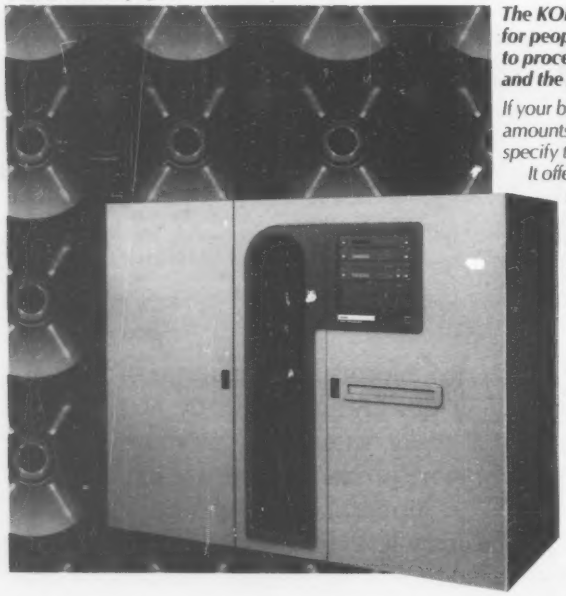
"I have a 95/5 rule for two-phase commmit," said Wai, who worked on two-phase commit technology at Tandem. "Ninety-five percent of the applications out there probably won't need distributed databases for a long while; 5% will."

Informix, Wai said, is working on two-phase commit. The company offers a distributed-read capability through its Informix/Star product, which will ship in the first quarter of 1990. "We're committed to two-phase commit," he said. "But we think there are other things customers are asking for that have a higher priority right now."

IBM, one of the first to provide limited two-phase commit, is still working on a total solution. "IBM did an SAA [Systems Application Architecture] announcement in October 1988, when DB2 Version 2.2 was announced," said Dave Wisneski, DB2 advisory planner at IBM's Santa Teresa, Calif., laboratory. So far, one major vendor — Tandem — appears to have delivered on two-phase commit, its competitors admit. Other vendors openly admit that Tandem had to face the problem first, because many Tandem machines have been used as front ends to IBM mainframes.

At Sybase, two-phase commit is an integral part of the DBMS product, which was first shipped in 1987, said Berl Hartman, director of product marketing. "But you have to program for it," Hartman noted. "It's not appropriate for every application."

© Eastman Kodak Company, 1989



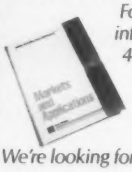
The KODAK Optical Disk System 6800... for people with a lot to store, and not much time to process it. The system has the highest capacity and the highest transfer and access rates.

If your business needs to store and retrieve significant amounts of image-intensive or alphanumeric data, specify the KODAK Optical Disk System 6800.

It offers unparalleled storage capacity, flexibility and speed, in the smallest footprint per megabyte available today. The KODAK Automated Disk Library can put you on-line to over one terabyte—that's 1000 gigabytes —of stored data in just 6.5 seconds. Available in several configurations, the library requires as little as 13 square feet of floor space.

Additionally, the KODAK Optical Storage Interface can connect the system to a wide range of minicomputers or IBM® mainframe host environments.

For a complete package of information, call 1 800 445-6325, Ext. 993A.



We're looking for systems integrators.

SO MUCH DATA, SO LITTLE TIME. CALL KODAK

The new vision of Kodak

Boone

FROM PAGE 31

company the effective use of CASE tools and methods run contrary to the software-crafting culture dominant in today's development environment. The quality and capability of CASE technology will become less responsible for the success of CASE than cultural readiness.

The software developer of today, who is motivated more by self-expression and loyalty to his profession, will find himself in fewer numbers at corporate information systems departments and working for outsid · professional service firms or even CASE vendors.

He will eventually have a richer set of tools that will allow him to more rapidly build business applications of a higher quality, but perhaps not before this next decade is consumed by building the information infrastructure and development architecture needed to sustain these benefits. A whole new stratum of software developers will begin to emerge who will develop that infrastructure/architecture.

Unfortunately, the widening difference in productivity between various corporate IS shops because of CASE adoption, as well as the investment needed for CASE, will result in a more stratified have and have-not situation.

Only the smallest, nimblest shops or the largest, most well-funded shops will be able to afford the immense investment that is needed to make CASE truly effective.

The vast majority, who are slow to adopt CASE or approach CASE solely on a tactical, project-by-project basis, will eventually find themselves slipping behind in competitive capability or not getting the payback they expect from their CASE investment and finally relinquishing information management support to outside professional service firms who have been busily beefing up their strategic CASE capabilities.

It has been said that "Wall Street, like military establishments, tends to project the future as a mirror image of the past. Both are always fighting the last war" [*Forbes*, Sept. 18, 1989].

Certainly, the data processing profession is not guilty of this mistake in forecasting; it is well recognized that the battlefield has changed. Information management capabilities are becoming a critical, competitive success factor in businesses as opposed to just an overhead factor.

It has also been said that ignorance of the past will condemn the future to repeat the mistakes of the past. Learning from experience is not an especially well-developed trait of today's software developer. The overly high expectations that have been encouraged with users, the short-term payback expectation, the rush to get on to the next project and the obsessive and exclusive fascination with technology are factors that have stood in the way of software developers paying attention to the *process* of software development itself.

Yet the product — software — is literally a product of the process that produces it: the complex interaction of people, methods, tools and the environment.

So the process cannot continue to be ignored if software development capabilities are to be improved. The process cannot be improved while it remains such a moving target. It must be defined and repeatable, and conformance to the process must be measured. Important lessons have been learned the hard way from the recent Japanese industrial successes and are rapidly spreading among American business management today.

In the next decade, we will see users knocking at the door of data processing, demanding the adoption of these new management principles. Then, the solution to improving software development will begin to shift from being capital-intensive to being process-intensive. The shops that adopt this new context for CASE will be the most successful.

Boone is president of Case Research Corp., an industry analysis, education and consulting firm in Bellevue, Wash.

HARD BITS

BBN demonstrates bid to step into commercial arena

BBN Advanced Computers, Inc. got a step closer to mainstream information systems last month when it demonstrated Oracle Corp.'s relational database management system running on its TC2000. No availability date has been announced, however. BBN previously said it was working with Oracle to put Oracle Release 6.0 on its system. To date, BBN has had little success in the commercial market, and the support of a mainstream DBMS such as Oracle could help it win a few commercial accounts, according to industry observers.

Pyramid Technology Corp. and **AT&T** announced plans to develop a multiprocessor, Unix-based system. AT&T has also retained the rights to resell Pyramid's existing high-performance Unix system, the Miserver, as well as the new box.

Data General Corp. named **Common Language Systems** in Orlando, Fla., as a reseller. Common Language Systems will sell the DG Aviion systems to the legal market. Common Language Systems makes a software package for law office management. Aviion is DG's reduced instruction set computing system.

Wang Laboratories, Inc. and **International Datacasting Corp.** signed a deal that calls for both companies to sell Wang imaging systems using International Datacasting's satellite communications networks. This package would allow customers to transmit image documents via satellite.

NEW AT DEXPO '89

The following products were introduced at Dexpo West in Anaheim, Calif.:

• **Target Systems Corp.** in Marlboro, Mass., introduced a bulletin-board software tool for Digital Equipment Corp. VAX/VMS users. The Target Bulletin Board Version 1.0 information exchange software was designed to distribute company and group-related information and reportedly includes interactive user forums and VMS mail exchange capabilities. The software also provides a windowing environment for DEC VT terminals and a centralized or distributed database in the Decnet environment.

Pricing ranges from $4,995 to $10,000, depending on CPU size.

• **Intra Computer, Inc.** in New York announced the SAM2010. The product was created to power down a host computer system in the event of heat, humidity, smoke or water damage. The unit can be mounted in a standard 19-in. rack, the vendor said, and includes a temperature display, two temperature probes and nine inputs to accommodate various sensors. A microcomputer is incorporated for communications, data acquisition and control functions.

The system is priced from $4,395 to $5,980, depending on the configuration.

• **Viking Software Services, Inc.** in Tulsa, Okla., unveiled Version 3.0 of its data entry and screen forms management software. According to the company, the latest release will include pop-up and pull-down menus and an expanded parameter file/option system. Alphanumeric field-edit routines and painting functions have also been added. The software is priced from $700 to $10,600, depending on hardware platform.

• A software package designed to provide management, security and audit functions in a DEC VAX/VMS environment was announced by **Absolute Security, Inc.** in Maynard, Mass. Called Investigator Plus, the product runs on an MS-DOS-compatible workstation attached to the DEC VAX/VMS system via either an RS-232 port or an Ethernet connection. It reportedly offers complete control over source code and batch procedure operations, and on-line backup and recovery capabilities are included to implement file restoration. The software program has a price tag of $8,500.

• **Compushare, Inc.**, a Lubbock, Texas-based firm, introduced its Human Resources Management Module with Decwindows capability. The product can recall scanned images of supporting source documents, the company said, including resumes, letters of recommendation and government forms. Written exclusively for the DEC VAX/VMS platform, a binary license is priced from $5,000 to $15,000, depending on CPU and customer configuration requirements.

• **Hancock Software** in Watertown, Mass., announced an enhanced version of the Filemaster file and directory management software. Designed to run in a DEC VAX/VMS environment, Version 1.1 provides an easy VMS interface for novice users and offers more sophisticated features aimed at the power user, the company said. Single-CPU pricing ranges from $495 to $7,950, depending on VAX model.

• **Servio Logic Development Corp.**, headquartered in Beaverton, Ore., debuted a version of its Gemstone object-oriented database management system created specifically for DEC workstations and systems. According to the company, the product runs on reduced instruction set computing Decstations and Decsystems runnning the DEC Ultrix operating system. Pricing varies according to host platform and user license and typically ranges from $22,000 to $87,000.

• A 90 page/min. magnetographic printer was unveiled by **Bull Peripherals Corp.** in Waltham, Mass. The Bull MP6090 can be connected to any DEC computer system that incorporates a DEC DMF 32 or Wespercorp DCP 1100 controller, the company said. The device offers a 240 dot/in. resolution and carries a list price of $103,314.

• **Software Partners/32, Inc.** located in Topsfield, Mass., previewed two products due for release early next year. The Delphi Data Center Management System incorporates a hardware and software management module that allows the system manager to model the impact of a data center disruption on end users. It costs $24,995 per data center. The SDI program was designed to aid system security managers in a DEC VAX/VMS environment and includes the ability to monitor and control a user's terminal, allocate devices and track attempts to open files. A site license costs $18,500.

• A DEC VAX/VMS-based interactive graphics drawing program was announced by **Procyon Computer Systems, Inc.** based in Westlake Village, Calif. Star*Draw reportedly allows users to create drawings via an on-screen menu system on DEC's Vaxstation platform. The program offers 1,024 displayable colors and incorporates a text-editor function. It can run on a stand-alone basis or linked to a user's program as a graphics kernal, and it is priced from $4,995 for a single-user license.

• **MCBA, Inc.** in Glendale, Calif., introduced another version of the company's Classic Accounting, Distribution and Manufacturing software. The latest release reportedly provides a pop-up windowing function for DEC VAX systems to give users multitasking capabilities. Customizable menus and on-line Help facilities are included, and the software is priced from $1,500 to $16,000, depending on hardware platform.

• A DEC VAX system monitor was introduced by **Data Center Software, Inc.** The Beverly, Mass.-based company claims that its VAX-Alert system-management utility continuously monitors predefined system activities and notifies appropriate personnel of such activities via VMS Mail or Broadcast functions. The product is available from $395 to $995, depending on CPU models.

• **Softool Corp.** in Goleta, Calif., announced CCC/Basic for change and configuration management activities in development and maintenance environments. Running on a DEC VAX/VMS computer, the software operates through various menus and panels and controls changes to individual components within each version of an application, the vendor said. The price ranges from $2,700 to $56,000.

NEW PRODUCTS — SOFTWARE

Computer-aided software engineering

Cortex Corp. has enhanced Corvision, its computer-aided software engineering product for Digital Equipment Corp. VAX machines.

Version 4.32 reportedly provides a menu-driven screen painter, improved database import capabilities and automated translation of applications into foreign languages.

The software documentation now includes both terminal and workstation interfaces, as well as a runtime guide. The upgrade will be provided free of charge to existing users, according to the company.

Corvision is priced from $50,000 to $150,000, depending on configuration.

Cortex
138 Technology Drive
Waltham, Mass. 02154
617-894-7000

Database management systems

Platinum Technology, Inc. has announced a revised release of its migration and alteration software tool for IBM's DB2 relational database management system.

Version 2.0 of RC/Migrator offers support for the IBM DB2 Version 2 environment and automates the DB2 object, data and security migration and alteration process. Pricing ranges from $18,000 to $35,000, depending on CPU size.

Platinum Technology
555 Watersedge Drive
Lombard, Ill. 60148
708-620-5000

Integrated Micro Products, Inc. (IMP) has announced an agreement to develop and market Oracle Corp.'s database tools for use with IMP's SR series of fault-tolerant computers and MJ series of multiprocessors.

According to both vendors, this is the first time Oracle's tools will be available on fault-tolerant AT&T Unix System V-based systems.

Pricing for IMP's multiprocessor platform will start at $34,000, and the fault-tolerant machines are available from $60,000.

IMP
3004 Mission St.
Santa Cruz, Calif. 95060
408-429-1338

Development tools

Concurrent Computer Corp. has announced a graphical user interface developed to run on the company's line of real-time AT&T Unix-based computers.

Christened SP-Xmotif, the product is bundled with the X Window System and includes X terminal emulator support to guarantee a uniform interface, the vendor said. The software does not require extensive interface programming experience and is scheduled for delivery in December. It is available with initial Concurrent Graphics Subsystems at no additional charge, and additional copies are priced at $2,450.

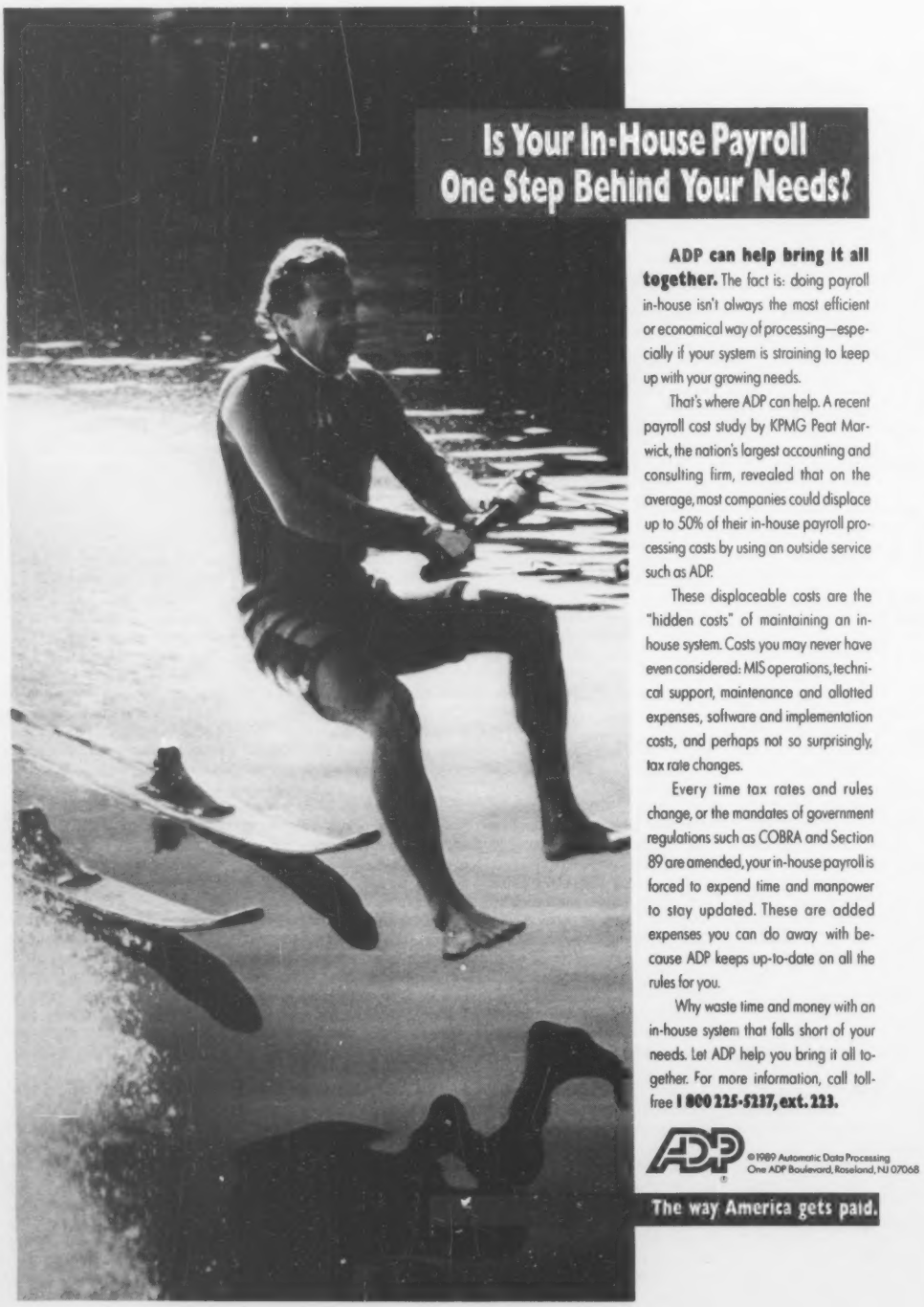
Concurrent
106 Apple St.
Tinton Falls, N.J. 07724
201-758-7000

Utilities

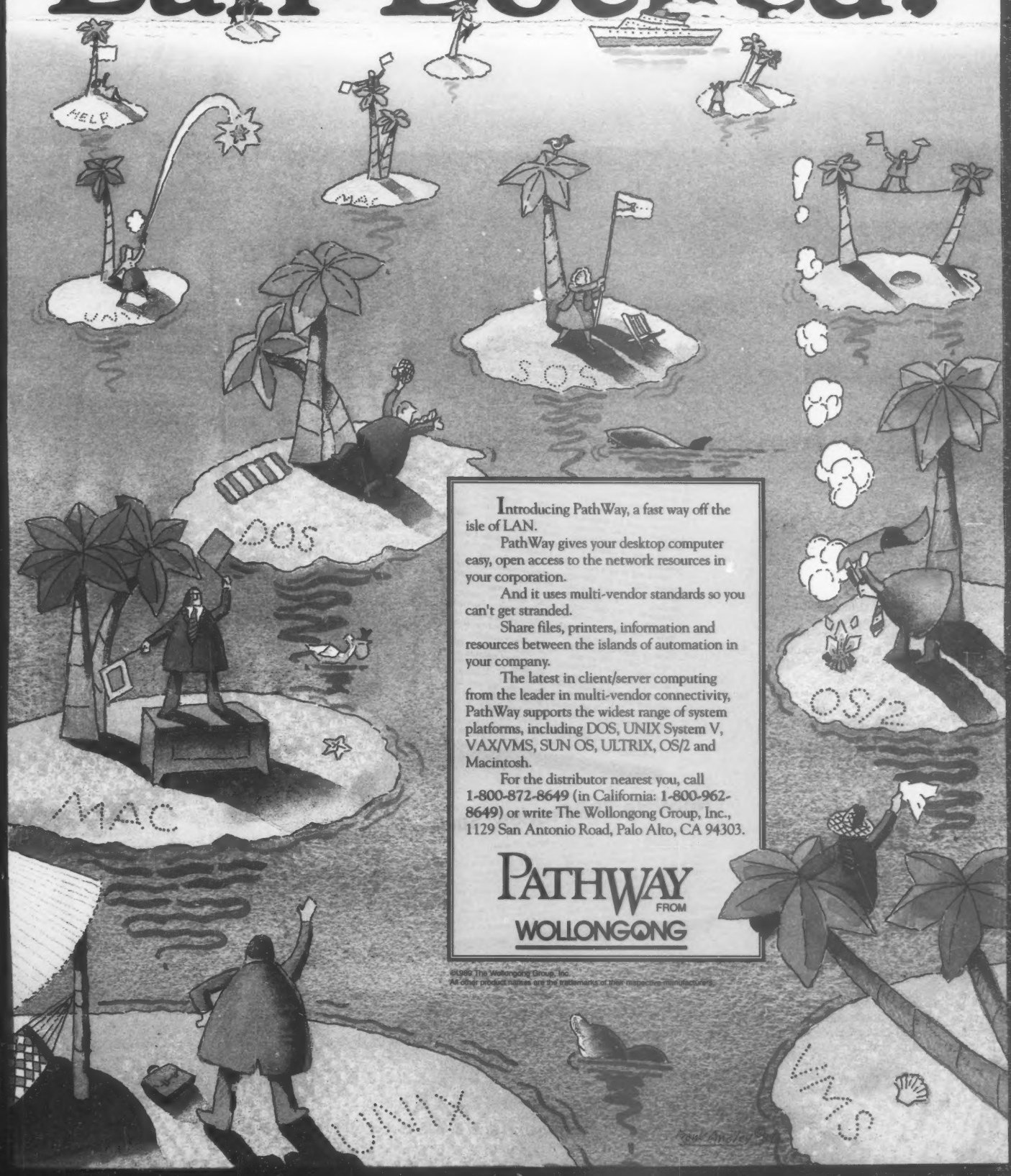
Systems Center, Inc. has announced a software product that transfers data and integrates operations among IBM, Digital Equipment Corp. and Tandem Computers, Inc. machines.

According to the company, Network Datamover-CICS allows users direct access to facilities for file transfer, automated operations, audit and security functions. The program executes services with any processor running another member of the Network Datamover family, including NDM-VM, NDM-VSE, ND-VMS and NDM-PC. The product is priced from $5,000 to $15,000; a corporate license is available for $50,000.

Systems Center
1800 Alexander Bell Drive
Reston, Va. 22091
703-264-8000


Is Your In-House Payroll
One Step Behind Your Needs?
ADP can help bring it all together. The fact is: doing payroll in-house isn't always the most efficient or economical way of processing—especially if your system is straining to keep up with your growing needs.
That's where ADP can help. A recent payroll cost study by KPMG Peat Marwick, the nation's largest accounting and consulting firm, revealed that on the average, most companies could displace up to 50% of their in-house payroll processing costs by using an outside service such as ADP.
These displaceable costs are the "hidden costs" of maintaining an in-house system. Costs you may never have even considered: MIS operations, technical support, maintenance and allotted expenses, software and implementation costs, and perhaps not so surprisingly, tax rate changes.
Every time tax rates and rules change, or the mandates of government regulations such as COBRA and Section 89 are amended, your in-house payroll is forced to expend time and manpower to stay updated. These are added expenses you can do away with because ADP keeps up-to-date on all the rules for you.
Why waste time and money with an in-house system that falls short of your needs. Let ADP help you bring it all together. For more information, call toll-free 1 800 225-5237, ext. 223.
ADP
©1989 Automatic Data Processing
One ADP Boulevard, Roseland, NJ 07068
The way America gets paid.

Lan-Locked?



Introducing PathWay, a fast way off the isle of LAN.

PathWay gives your desktop computer easy, open access to the network resources in your corporation.

And it uses multi-vendor standards so you can't get stranded.

Share files, printers, information and resources between the islands of automation in your company.

The latest in client/server computing from the leader in multi-vendor connectivity, PathWay supports the widest range of system platforms, including DOS, UNIX System V, VAX/VMS, SUN OS, ULTRIX, OS/2 and Macintosh.

For the distributor nearest you, call **1-800-872-8649** (in California: **1-800-962-8649**) or write The Wollongong Group, Inc., 1129 San Antonio Road, Palo Alto, CA 94303.

PATHWAY FROM WOLLONGONG

©1989 The Wollongong Group, Inc.
All other product names are the trademarks of their respective manufacturers.

Cognex Corp. has announced a vision software tool designed to run on any of the company's single-board machine vision systems.

The Contour Finder Tool locates objects within an image by detecting the outlines and curves that comprise the object. It is included in the firm's software library and is bundled with other search and object location tools in the Cognex Finding software package at a list price of $2,200.

Cognex
15 Crawford St.
Needham, Mass. 02194
617-449-6030

Applications packages

Traeger and Associates, Inc. has announced its Data Processing Service Tracking System, a software package that monitors development backlogs, requests for enhancements and equipment installation requirements.

The menu-driven application software operates on all models of the IBM Application System/400 and is targeted at development managers, project leaders, database administrators, systems analysts and others who oversee progress on all requests for service. A problem reporting segment is provided for tracking and reporting problem resolution status.

The software costs $3,895 per copy.

Traeger and Associates
907 N. Austin St.
Seguin, Texas 78155
512-379-7709

Cyborg Systems, Inc. has released its Time and Attendance Solution package, a time and attendance data collection system designed for integration with the company's Solution Series line of human resource management, payroll processing and fixed asset accounting software.

In addition to the software, the product reportedly includes time recorder and data collection hardware and provides the capability to track an unlimited number of hourly employees, the vendor said. Three different badge-reader systems are available.

The system runs on mainframe and midrange computers, as well as IBM Personal Computer ATs and compatibles. Licenses are priced from $7,500, the firm said.

Cyborg Systems
2 N. Riverside Plaza
Chicago, Ill. 60606
312-454-1865

Sas Institute, Inc. has expanded its Sas System under the Unix family of products for Sun Microsystems, Inc. SunOS and Hewlett-Packard Co. HP-UX Unix environments with the announcement of three additional software packages.

Sas/Ets is an econometric and time-series analysis tool for forecasting, planning and financial modeling. Sas/Or is an operations research, project management and decision support tool, and Sas/Qc software offers specialized tools for statistical quality improvement and experimental design applications.

First-year license fees range from $395 for a single workstation to $7,500 for 500 workstations.

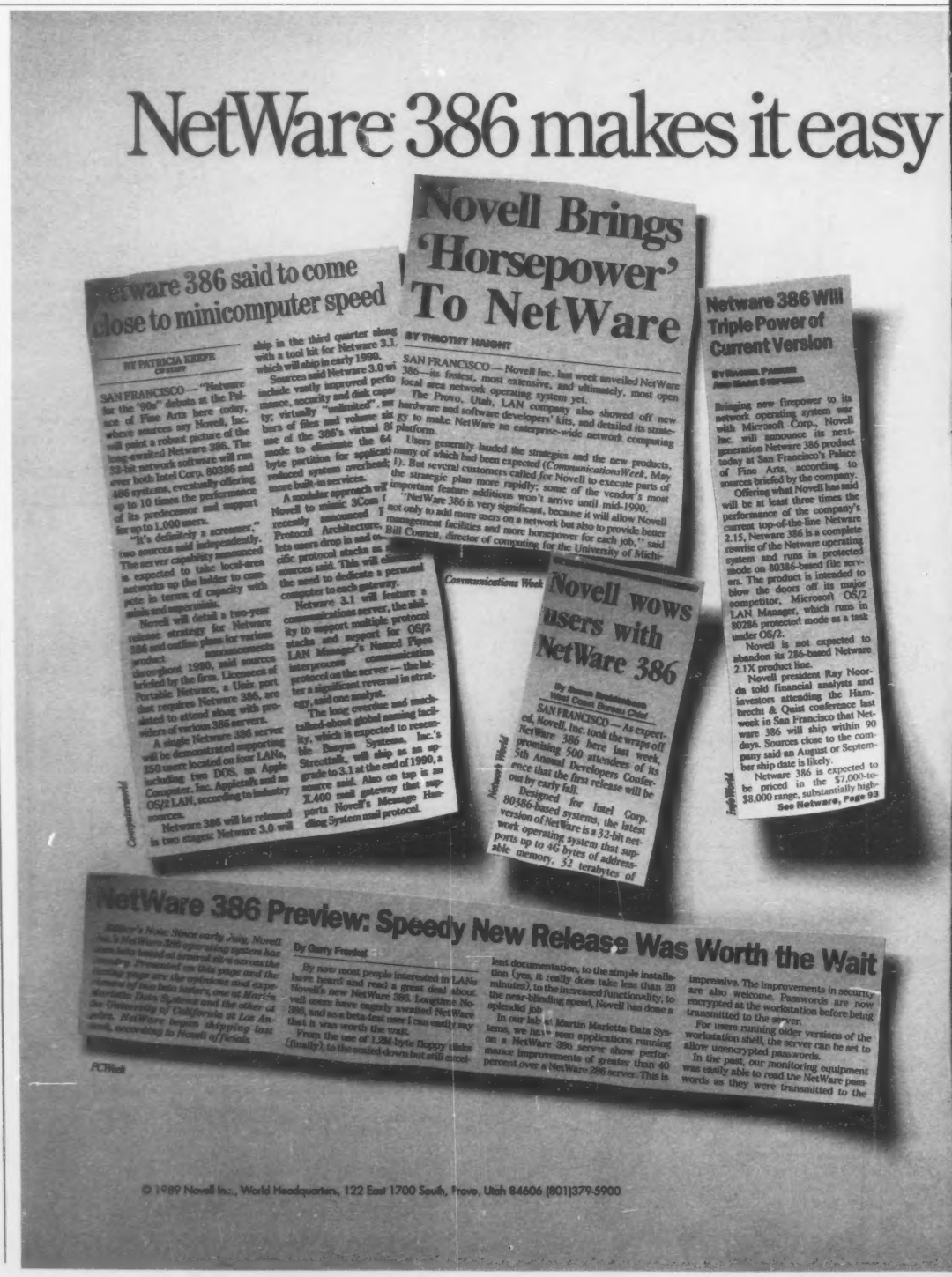
Sas Institute
Sas Circle
P.O. Box 8000
Cary, N.C. 27512
919-467-8000

MCBA, Inc. has announced a fourth-generation language-based financial applications software package targeted at cross-industry companies with general accounting needs and revenues in excess of $50 million, the company said.

The Resolution Financial System reportedly frees the user from working directly with the computer's operating system and provides seamless integration between the product and Oracle Corp.'s SQL*Forms and SQL*Report Writer packages. Applications include accounts payable, accounts receivable, fixed assets and depreciation, general ledger, multiple currency management and payroll.

Individual applications are priced from $8,000 plus the cost of any Oracle tools required.

MCBA
425 W. Broadway
Glendale, Calif. 91204
818-242-9600


NetWare 386 makes it easy
Novell Brings 'Horsepower' To NetWare
Netware 386 Will Triple Power of Current Version
Novell wows users with NetWare 386
NetWare 386 Preview: Speedy New Release Was Worth the Wait
© 1989 Novell Inc., World Headquarters, 122 East 1700 South, Provo, Utah 84606 (801)379-5900

NEW PRODUCTS — SYSTEMS

Data storage

Fujitsu America, Inc. has announced a high-capacity Winchester disk drive targeted to OEM and value-added resellers.

The M2392D is a 1.84G-byte storage device that provides a 12 msec average access time and a 2.75M bit/sec. data transfer rate. The drive was specifically designed to increase the data transfer rate capabilities of Digital Equipment Corp. I/O channels.

Evaluation units are available, and production quantities are slated for shipment by year's end. The product is priced at $6,995 in OEM quantities.

Fujitsu America
3055 Orchard Drive
San Jose, Calif. 95134
408-432-1300

Identica has announced a tape storage subsystem designed to take advantage of digital audio technology capabilities.

Dubbed the IDT-600, the DAT unit reportedly accommodates as much as 600M bytes of formatted storage on a standard four millimeter DAT cartridge. The unit was developed to back up high-capacity hard disks on workstations or on local-area networks using IBM Personal Computers, Personal System/2s or compatible computers. The product comes with a three-year warranty and is priced at $3,895 for an internal model and $3,995 for an external one.

Identica
Building 7
3350 Scott Blvd.
Santa Clara, Calif. 95054
408-727-2600

An optical disk storage system developed to increase the memory capacity of Pick Systems-based computers has been announced by Capital Software, Ltd.

Marketed jointly by Capital Software and Fujitsu Microsystems of America, the Class system consists of an IBM Personal Computer AT-compatible workstation with a monochrome monitor, one or more optical disk drives and a Fujitsu Series 2000 computer. Up to eight optical disk drives may be connected to each Class workstation to give Pick users on-line memory for business archival applications. Each optical platter is removable and offers a capacity ranging from 800M bytes to 3.2G bytes. An entry-level system costs $18,955.

Capital Software
8th Floor
35 E. 21st St.
New York, N.Y. 10010
212-228-1340

I/O devices

Hewlett-Packard Co. has introduced a display terminal designed for users who require ANSI and Digital Equipment Corp. VT320 compatibility.

The HP 700/32 is specifically suited for AT&T Unix operating environments and general-purpose applications, according to the company. Features include four pages of display memory, 15 menu-programmable function keys and a 72-MHz refresh rate.

The 14-in. display unit is available in amber, green or page-white phosphor and is priced at $575.

HP
3000 Hanover St.
Palo Alto, Calif. 94304
415-857-1501

Databeam Corp. has expanded its CT 1000 document conferencing system by adding video capture and color capabilities, the company said.

The system was designed to permit users in different locations to collaborate as if they were in the same room. The product includes a color scanner and printer, and both are reportedly capable of producing 400 dot/in. resolution images.

Transmissions are sent and received via standard telephone lines in a conference-call environment.

Pricing for the CT 1000 starts at less than $25,000.

Databeam
3256 Lochness Drive
Lexington, Ky. 40503
606-273-3204

to believe what you read.

Novell Is Shipping Netware 386 3.0 Earlier Than Expected

NetWare 386 May Pack Punch To Knock Out the Competition

NetWare 386 gets high praise

NetWare 386: The network server platform for the '90s

LAN TIMES

NOVELL

For network solutions, you should be seeing red.

For more information, call 1-800-LANKIND.

The strength of a team is its depth.

Winning players usually have a system. Which means Wyse is way ahead of the game. Because we have a full range of systems.

In fact, for total system solutions, no one can match Wyse's depth in PCs, terminals and monitors. With our line-up, Wyse can help you fill just about every position on your roster.

From simple single-user set-ups, to power-hungry applications like DTP and CAD/CAM, on up to the most sophisticated multi-user systems and local area networks.

Wyse systems make for smart solutions.

Because all Wyse components are designed for full compatibility and ease of connectivity with each other. As well as with any industry standard you may already be using.

And wherever you choose to use Wyse hardware, you're assured of a thoroughly professional performance.

That's why it makes sense to make Wyse part of your game plan. Call our toll-free number today (1-800-438-9973). We'll send you full information. In depth.

Because with Wyse, you have all the makings of a winning team.

(A) WY-3225, 25 MHz 386 as multi-user platform driving (B) WY-60 terminal, (C) WY-150 terminal and (D) WY-370 color terminal. (E)WY-3225 as LAN fileserver with (F) WY-2116 16 MHz 286 with WY-650 VGA color monitor, (G)WY-2112 12.5 MHz 286 with WY-700 hi-res monitor, (H) the Wyse Networker and (I)WY-3216 16 MHz 386 with (J)WY-7190 hi-res 19" monitor.

1-800-GET-WYSE

WYSE

WYSE is a registered trademark of Wyse Technology.
All product model numbers are trademarks of Wyse Technology.

MICRO BITS

Douglas Barney

A change of mind-set

The Microsoft view of the world. Longtime readers of this column may have the impression that Microsoft is a far from perfect company. We've poked fun at their corporate culture, vocabulary, manner of dress and especially how their love of technology can make them blind to true market forces.

All this should not overshadow the fact that Microsoft is actually a fine company with a well-thought-out — and profitable — view of computing. Unlike some of the dreamers in this business, Microsoft also has the resolve, stubbornness and resources to see this view through. No, they are not perfect. But they are darn good.

Unfortunately, it is taking a long, long, really long time for the Microsoft view of computing to materialize. For example, Microsoft Windows, announced eons ago, is only now beginning to gain some serious momentum — most recently with the long-delayed IBM endorsement of Windows. Not long ago, Microsoft announced that its second major Windows application with OS/2 is taking

Continued on page 57

Steel firm scraps minis for PCs

Speed, reliability and reduced maintenance sell Florida Steel on the swap

ON SITE

BY RICHARD PASTORE
CW STAFF

TAMPA, Fla. — Eighteen Digital Equipment Corp. PDP-11/73 minicomputers may wind up on the scrap heap at Florida Steel Corp. The company's 16 steel plants, which produce reinforcing bars for construction projects, will eventually replace the minis with networked IBM-compatible personal computers supporting a key steel-production application.

The switch is intended to boost processing speed, increase reliability and cut maintenance costs, said Paul Hennessey, manager of information systems.

The Intel Corp. 80386-based PCs, which have taken the place of DEC equipment at two plants, run the same production software system 15 to 30 times faster than did the PDPs, said John Little, manager of Florida Steel's Washington, D.C., division.

For example, a task that determines the optimal way to cut the day's steel orders to minimize leftover scrap takes about 90 seconds on a PC.

"On the PDP, it took 30 minutes to do it, and during that time, the computer could not be used for any other function," Little said. Consequently, the production clerk who performed the task had to come to work in the early morning to get the job done before the rest of the staff showed up to work.

"Now, the draftspeople and production staff don't have to compete for the minicomputer's resources," Hennessey said. "Each has his own PC with full capabilities."

A second advantage on the PC side is that the crash of one machine does not knock out the whole plant. "When the PDP is down, we're out of business, basically," Little said. To go back to the old manual production-scheduling system would take a week's preparation; "in the meantime, we'd be here twiddling our thumbs," Little said.

In the past, Little was burned firsthand by a PDP drive crash. "It took four days to replace it and load our backup tapes," he recalled.

The components of the 7-year-old DEC systems have become increasingly difficult and costly to maintain, according to Hennessey. Keeping costs down is tantamount at Florida Steel, which is feeling the competitive price squeeze that has been gripping the steel industry for most of the decade.

Thriftiness is actually a "hallmark" of Hennessey's department, he said. The entire IS and telecommunications budget was a remarkably low one-third of 1% of the firm's $532 million 1989 revenue. The company buys used computer equipment whenever possible and has maintained its IS staff size at 15 for the past three or four years.

Hennessey's technical managers said they have no com-

Continued on page 59

RIC FERRO/BLACK STAR

Florida Steel's *Holcomb, Perry and Hennessey*

Sun joins forces with DBMS elite

BY JAMES DALY
CW STAFF

Sun Microsystems, Inc. is demonstrating what mothers have told their kids for years: It's nice to share.

In recent weeks, the workstation vendor has teamed up with some of the big guns in the lucrative relational database management system field in an effort to catch a wave designed to wash them into the general business market in a big way.

Under its Data Management Program, Sun will work hand-in-hand with Informix Software, Inc., Ingres Corp., Oracle Corp. and Sybase, Inc., which together account for about 85% of the relational DBMS market.

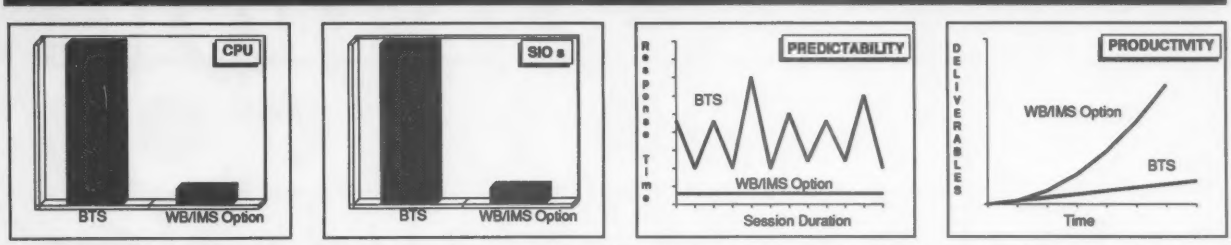
The move swiftly ends a long-standing rumor that Sun would endorse one DBMS product and run with it in much the same way Digital Equipment Corp. teamed up with Ingres. The leading candidate for that slot was Sybase, which has been frequently linked with Sun machines in powerful

Continued on page 58

Inside

- Lotus, NEC and other product reviews. Page 53.
- Wang could have had a light — now it does. Page 58.
- Hypertext developers reject the standard notions. Page 59.

Technology Breakthrough: IMS DB/DC on a PC !



Micro Focus COBOL/2 Workbench™ with the IMS Option: IMS and MORE on a PC Workstation!

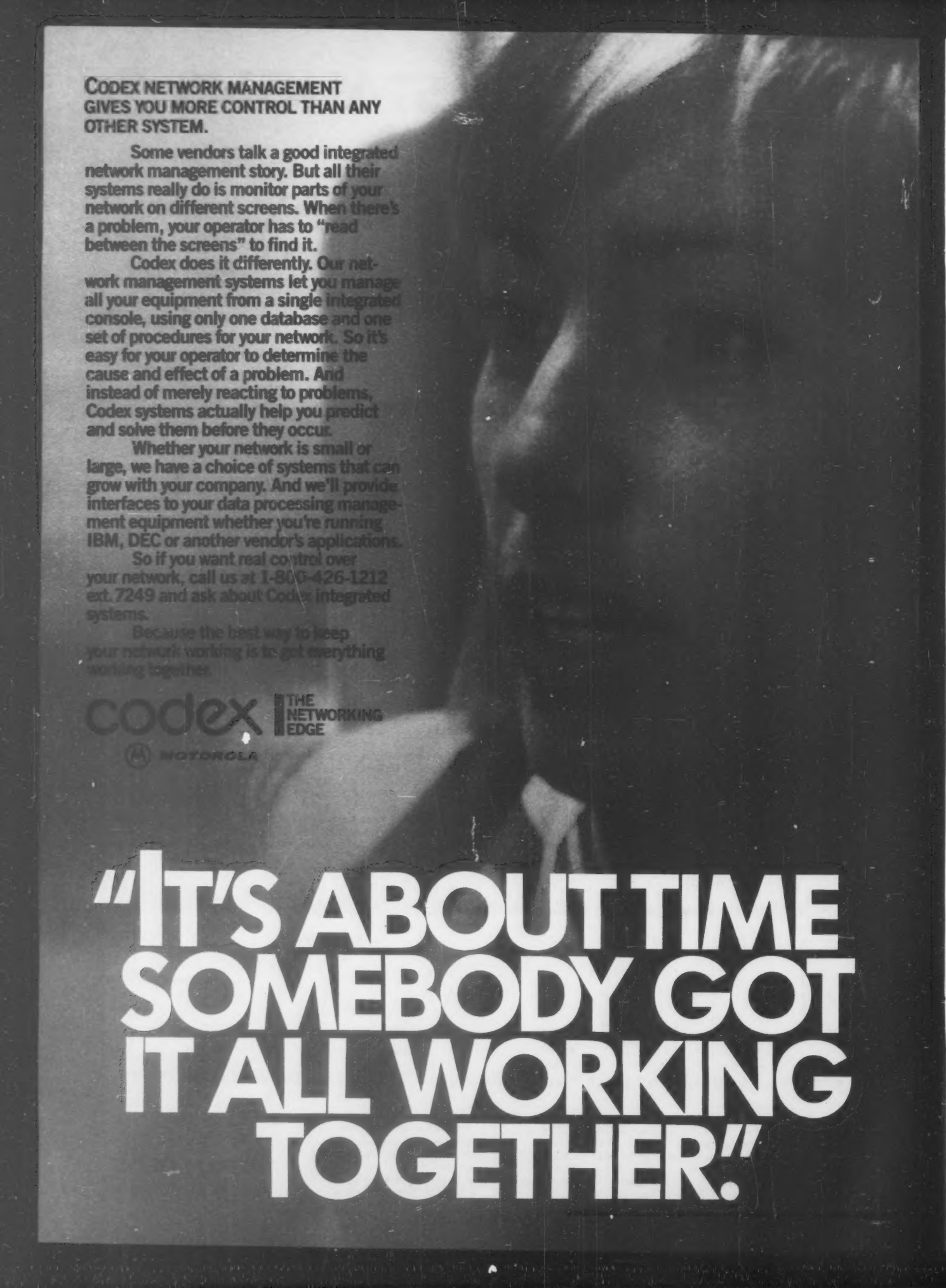
- **Relieves the Mainframe of TSO/BTS/SPF Burden**
- **Visual Source Code Debugging**
  - ANIMATE your code and watch it run. Unique and powerful!
  - Programmer can control execution path and data content.
- **Immediate System Regeneration**
  - DBD, PSB, MFS, ACB Gens done in seconds!
  - Offload IMSVS, CICSVS, CICS-DL/I, COBOL, SPF, DB2
- **Consistent subsecond response time**
- **Installed in major Fortune 1000 Data Centers worldwide!**

For the most efficient development of your mainframe IMS DB/DC applications, call us now.

1-800-872-6265

US: 2465 E. Bayshore Road
Palo Alto, CA 94303
(415) 856-4161

MICRO FOCUS®
A Better Way of Programming™


CODEX NETWORK MANAGEMENT GIVES YOU MORE CONTROL THAN ANY OTHER SYSTEM.
Some vendors talk a good integrated network management story. But all their systems really do is monitor parts of your network on different screens. When there's a problem, your operator has to "read between the screens" to find it.
Codex does it differently. Our network management systems let you manage all your equipment from a single integrated console, using only one database and one set of procedures for your network. So it's easy for your operator to determine the cause and effect of a problem. And instead of merely reacting to problems, Codex systems actually help you predict and solve them before they occur.
Whether your network is small or large, we have a choice of systems that can grow with your company. And we'll provide interfaces to your data processing management equipment whether you're running IBM, DEC or another vendor's applications.
So if you want real control over your network, call us at 1-800-426-1212 ext. 7249 and ask about Codex integrated systems.
Because the best way to keep your network working is to get everything working together.
codex
THE NETWORKING EDGE
MOTOROLA
"IT'S ABOUT TIME SOMEBODY GOT IT ALL WORKING TOGETHER."

PRODUCT REVIEWS

Pioneer Software spiffs up interactive query tool

Q+E Version 2.1 from Pioneer Software Systems, Inc. is a useful interactive query tool and simple data manager for Ashton-Tate Corp. Dbase data files. It allows users to select, sort and edit information as well as create new databases and maintain indexes. Multiple databases can be related in one window.

The tool can be combined with Microsoft Corp.'s Windows' dynamic data exchange (DDE) protocol and Excel. DDE provides a communications pathway between applications that are operating under Windows. Programs can use this link to pass along data and messages.

When a link is active, Q+E is used to perform a query against a database, and the results are passed directly into the Excel worksheet. The spreadsheet is automatically updated whenever the data or the query changes. It comes with an Excel macro sheet that adds several new commands to Excel's data menu. They can be used to query external databases.

Q+E includes DDE support functions that allow other applications to control it. It is possible to write Excel macros that manipulate Q+E as if it were being controlled from the keyboard.

The product presents the contents of a database file in a

Continued on page 55

Q+E Version 2.1

Price: $149

- Performance: Very good
- Documentation: Good
- Ease of learning: Very good
- Ease of use: Very good
- Error handling: Very good
- Support: Good to very good
- Value: Very good

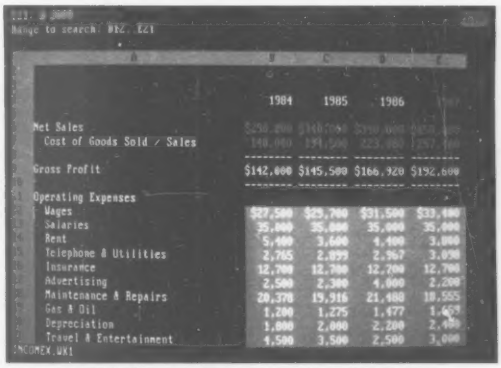
Lotus 1-2-3 Release 2.2 easier

Although Lotus Development Corp.'s Lotus 1-2-3 Release 2.2 might be eclipsed by the more intriguing Release 3.0, many users will find Release 2.2 to be the more important of the two.

Release 2.2 has less-demanding hardware requirements, and it can produce presentation-quality output. However, those expecting some of the slick features available in Release 3.0 will be disappointed.

Release 2.2 has several new features that contribute to its overall ease of use. It sports a simple file-linking capability, improved macro debugging and some minor enhancements in the graphics area. It also supports local-area networks so that network users can share files. An Undo command reverses the most recent action. A new menu item provides a search-and-replace capability that works for both labels and formulas.

Several features that used to require add-ins are now built in.



Lotus 1-2-3 Release 2.2 *adds several built-in features*

The features include minimal recalculation and keystroke recording for macros. The product ships with two add-ins: Allways, to provide presentation-quality output and what-you-see-is-what-you-get display, and Macro Library Manager, to let you store groups of macros separate from worksheets.

Release 2.2 maintains the industry-standard .WK1 file format and is nearly 100% keystroke-compatible with Release 2.01. This means that most macros will run as is. An exception will be macros that use the arrow

Continued on page 56

NEC's Prospeed introduces mobility to the desktop

With the Prospeed 386 Modular Personal Computer, NEC Technologies, Inc. has introduced a desktop computer with a portable component.

The dockable unit of the Prospeed 386 consists of a 17-pound clamshell-style portable module. It uses a 16-MHz Intel Corp. 80386, supports the Intel 80387 and comes with a 1.44M-byte floppy drive and a 40M- or 100M-byte hard drive. Two megabytes of 32-bit random-access memory (RAM) are standard and expandable to 10M bytes. The screen is a detachable, backlit, black-on-white LCD offering 640-by-350-pixel Enhanced Graphics Adapter (EGA) resolution and Video Graphics Array (VGA) resolution of 640 by 400 dot/in. for text. A terminal port supports an external monitor. A 2.4K bit/sec. modem is optional. There is a general-purpose proprietary 16-bit expansion slot, a serial port, printer port, docking port and a built-in power supply. A battery "slice" clips onto the back of the portable components.

The desktop docking unit adds three standard IBM Personal Computer AT slots and one XT expansion slot; two 5-in., half-height drive bays; a second serial port; a pair of telephone jacks; and its own AC power supply. It supports another 5M bytes of 16-bit RAM.

The software consists of MS-DOS 3.3 and VM/386 (a multitasking DOS-compatible environment for 386 systems) and a telecommunications program.

NEC's Prospeed *386 Modular PC has a detachable, backlit, black-on-white LCD screen*

Two manuals, both sized for portable use, cover the module and the docking unit. Both are reasonably complete and well-written. The main manual has three indexes, one for each section, which makes them hard to find.

The unit is basically easy to set up except that the math coprocessor must be installed by NEC or a dealer; there's no documentation for installing it, and the unit is not easy to open.

As a desktop unit, the NEC Prospeed is no harder to use than others. Detaching and reattaching the portable module is quick, easy and foolproof. On the road, the laptop is a typical hefty 17-pound AC-powered clamshell, full of pro-

Continued on page 56

NEC Prospeed Modular PC

Price: $7,598

- Performance: Satisfactory to excellent
- Documentation: Satisfactory
- Setup: Satisfactory
- Ease of use: Good
- Serviceability: Very good
- Support: Satisfactory to good
- Value: Good

DB2 ON YOUR PC

xdb

For the first time you can design, code, test, and run full scale DB2 applications on your PC.

Consider the productivity benefits of a rich PC programming environment. Imagine the savings of mainframe resources achieved by offloading DB2 development to PCs.

The XDB-DB2 Workbench puts a 100% DB2 compatible SQL DBMS and COBOL precompiler in your PC—seamlessly integrated with Micro Focus COBOL/2, ANIMATOR, and PC-CICS for interactive development. Workgroup development is supported by the multi-user XDB-SERVER.

Interested in DB2 power on a PC?

Call (301) 779-6030

XDB Systems, Inc.
7309 Baltimore Avenue
College Park, MD 20740
FAX (301) 779-2429

©1989 XDB Systems, Inc. XDB is a registered trademark of XDB Systems, Inc. Other product names are trademarks of their respective owners.

Powerflex: Upgrades in stages

To help buyers keep up with the improving technology in computer CPUs, Advanced Logic Research, Inc. has designed its Powerflex as a 12-MHz Intel Corp. 80286-based unit, upgradable via plug-in processor boards to a 386SX and to a 25-MHz 486 processor.

The 286 module offers average CPU speed for its class. The 386SX is actually a bit slower than the average 16-MHz 286. The 486 is, naturally, quite a bit faster.

The only anomaly is in hardware compatibility. ALR's unique BIOS setup allows the user to select COM ports or disable them; however, when a COM port is disabled, all of the addresses are disabled. Any board that requires COM1 or COM2 will not find the address.

The Powerflex has a small-footprint case, which is a boon for some users, but it necessarily restricts the unit's expandability. Also, it has no case lock to ensure internal security or a way of disabling the keyboard to keep data from being altered. ALR offers only two 40M-byte hard disk drives for this unit. Both can be installed for 80M bytes of capacity.

Advanced Logic's ***Powerflex is unremarkable but steady***

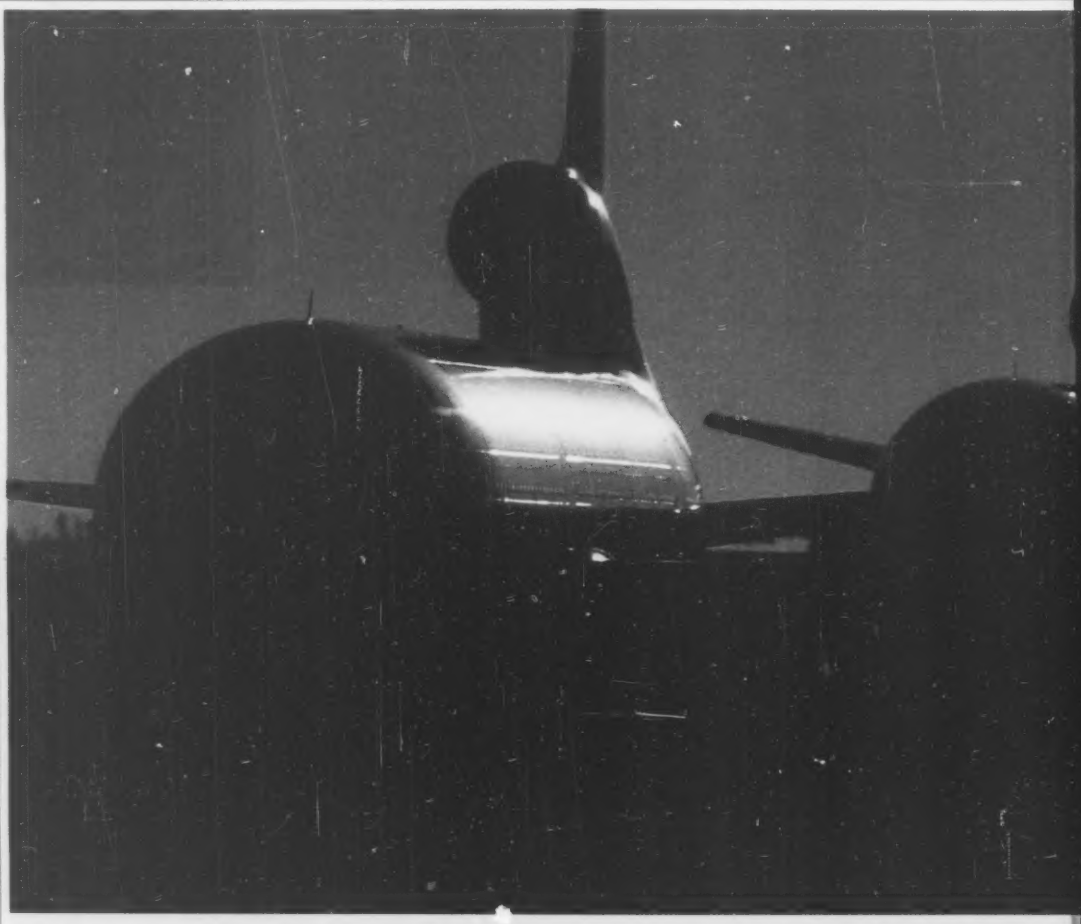
The Powerflex is generally unremarkable but steady. Upgrading to a 386SX involves simply plugging in the replacement module. There are no switch blocks or jumpers to fiddle with on the motherboard. Reconfiguration is done through the BIOS setup. Moving up to the 486 is done in a similar manner.

The technical support personnel are abrupt and disinterested and apt to leave a caller on hold for more than five minutes. The Powerflex is unique in its approach to upgrading: It spans the gap from AT workhorse to top-of-the-line desktop technology while offering an entry-level system at each of these three stages. The base model, 286-12, combines low price and average performance; its list price is $2,015. The 386SX's CPU is slightly below that of others, but its price is the lowest of all SXs ($2,410, with 1M byte of RAM). ALR is offering a $50 rebate for Powerflex customers who buy the SX module.

According to ALR, the 486 module will have a list price of $5,010. It is a bit early to peg value for 486s, but ALR's price certainly seems to be a good deal. When the 486 module is ready, ALR will buy back the 386SX module — at its original cost to the user — from owners who are ready to upgrade.

Advanced Logic Research, Inc., 9401 Jeronimo, Irvine, Calif. 714-581-6770.

ALR Powerflex (286 base model)
Price: $2,015
• Performance: Good to excellent • Documentation: Satisfactory • Setup: Good • Ease of use: Good • Serviceability: Satisfactory • Support: Poor to satisfactory • Value: Very good
ALR Powerflex (with 386SX module)
Price: $2,410
• Performance: Poor to excellent • Documentation: Satisfactory • Setup: Good • Ease of use: Good • Serviceability: Satisfactory • Support: Poor to satisfactory • Value: Very good



What good is a powerful databa

Even your most important data is worthless if you can't get to it—which is why you need NetWare® SQL.™

Nothing serves your DBMS needs better than NetWare SQL. That's because NetWare SQL performs all data management processing at your network server to significantly reduce the network's traffic and improve its performance.

NetWare SQL is Novell's relational database engine that provides powerful back-end database services to popular software applications and tools. It allows NetWare® users to access shared database resources using a wide variety of spreadsheet programs, accounting packages, 4GLs, database managers, program generators and many other applications.

Placing NetWare SQL at the server strengthens the integrity of your database. It provides fault tolerance through NetWare's highly acclaimed Transaction Tracking System. NetWare SQL even gives you con-

© 1989 Novell Inc., Novell Development Products Division, 6034 West Courtyard Drive, Suite 220, Austin, Texas 78730, 800-REDWORD (800-733-9673)

Pioneer

FROM PAGE 53

spreadsheet format with fields as columns and records as rows. Q+E commands are consistent with Windows standards, and using this program feels very much like using a spreadsheet, making the Excel link a natural.

To specify a select condition, the user points to a column and fills in a dialog box specifying the condition. Besides the standard comparison operators, there are Like and Not Like pattern-matching operators. Additional conditions are added using And or Or connectors. As each step of the selection is specified, the screen is immediately updated with only those records that meet the criteria. Records can be sorted on one or more fields. Q+E can search for values in a single field or across many fields. When a record containing the value is found, the record is highlighted. Memo fields are not searched.

Q+E provides summary functions to display the minimum, maximum, count, average and total of a column. When any of these functions are in use, the results are displayed at the bottom of the column. Detail records can be hidden to display only the summary information. Q+E cannot group or do subtotals.

Relating two files is as simple as clicking on the connecting field or fields in each window and choosing the Join or Outer Join operator. The individual windows are combined into a single view on the screen. One-to-one and one-to-many relationships are supported. Fields in a view may be edited, but record additions and deletions in a view are not allowed.

Q+E offers only limited SQL support but can be configured to support either Dbase IV SQL (the default) or ANSI SQL conventions.

A query or the results of that query can be saved in a file for later use, and Q+E can be used to maintain data. Information can be added, edited or deleted. A handy feature is the capability to enable or disable edits.

Q+E's knack for joining multiple files brings new capabilities to Excel. Using the Q+E link, a database that would be too large to load directly into a worksheet can be analyzed. Q+E works in the background to retrieve only the pertinent information.

There are no formatting options to control the appearance of fields and although query results can be printed, it is not possible to include report titles, modify column headings or control page layouts. Transferring the data to a worksheet adds all of Excel's formatting and charting capabilities.

Q+E supports Dbase II, Dbase III and Dbase IV data and index file formats, but not Nantucket Corp. Clipper's .NTX files or Fox Software, Inc.'s Foxbase .IDX index files.

Q+E 2.1 requires Microsoft Windows 286 or 386. Users of Excel 2.1 or higher can run Q+E using the runtime version of Windows and do not need a separate copy of Windows 286 or 386.

Q+E comes with a 150-page manual. Although the basics are well documented, in-depth coverage of the complicated DDE link process is lacking. There is on-line help. Installation is easy. There is only one diskette, and the files are automatically copied and installed.

No trouble to learn

Even the novice will have no trouble learning Q+E's basic operation in a couple of hours. Once learned, the program is easy to use. The point-and-shoot features of Windows are well-integrated into the interface. Command sequences are logical and flexible. The DDE links, however, take some time to learn.

Pioneer offers a 30-day money-back guarantee and extended support plans. Unlimited telephone support is available on a non-toll-free line. Technical support personnel provide quick and accurate answers.

For $149, Q+E provides a high level of integration between spreadsheet and database functions.

Pioneer Software Systems, Inc., Suite 324, 5540 Centerview Drive, Raleigh, N.C. 27606. 919-859-2220. 800-876-3101.

se if it's always stuck in traffic?

trolled access features to protect and secure your important data.

And because NetWare SQL has been designed specifically for the NetWare operating system, it's the optimal database environment for your distributed applications. Plus you get the comprehensive support of Novell's other data management products with development tools like Btrieve® and XQL,® the multi-level application program interface to NetWare SQL.

Start reducing database traffic jams and increasing your network's performance.

Ask your local Novell Authorized Reseller about NetWare SQL, or simply call 1-800-REDWORD (733-9673).

NOVELL

For network solutions, you should be seeing red.

Release 2.2

FROM PAGE 53

keys to make menu selections; since there are some new menu choices, these macros might need slight modification. Add-ins that were not written in complete compliance with the Lotus Developer Tools will not work with Release 2.2.

Despite a few significant enhancements, Release 2.2 still has one major flaw: poor graphics. The most notable enhancement is better spacing for overlapping legends and x-axis labels. Also included are improved colors and hatchings; also, bar charts now allow a margin rather than butting up against the left and right side of the frame. There is also a Group command for setting graph ranges for contiguous data. But the basic graph types remain the same and are limited by current standards.

Macros have seen significant improvement. The macro learn feature is built in. Macros can be run by name by pressing Alt-F3. Lotus has also added a few new macro commands. Even more useful is an enhanced Step mode for debugging macros. Step mode now displays the contents of the macro cell being executed and highlights the current macro command.

In terms of work space, Release 2.2 is comparable to Release 2.01; it leaves about 30K bytes less conventional random-access memory than the previous version — still more than most other spreadsheets allow.

The three-ring binder documentation format has been replaced by two paperback books, a reference manual and a quick-start/tutorial. There is also an upgrader's manual that has a concise summary of the enhancements and a handy quick-reference guide.

The on-line help system has a few enhancements, and the Allways documentation is integrated into the manuals. The package includes both 5¼- and 3½-in. disk formats. It takes approximately 10 to 15 minutes for installation.

Release 2.2 corrects a deficiency in earlier versions by warning you if you attempt to exit with unsaved data. Unfortunately, there is no warning if the Worksheet Erase command is issued before the file is saved.

Lotus provides six months of toll-free phone support, available 24 hours a day, seven days a week. The technicians are available, and they know what they are talking about.

Like its predecessors, Release 2.2 lists for $495. Those who purchased Release 2.01 after Sept. 6, 1988, can get a free upgrade; otherwise, the upgrade cost is $150. 1-2-3 users who previously purchased Allways can upgrade for $90.

This is certainly not the most significant product upgrade, but it will meet the needs of the vast majority of spreadsheet users. Those looking for a significant upgrade, or buying in for the first time (and who have the appropriate hardware), should move directly to Release 3.0.

Lotus Development Corp., 55 Cambridge Pkwy., Cambridge, Mass. 02142. (617) 577-8500.

THE ART AND SCIENCE OF SAIL

State of the Art

State of the Science

Managing information is a science.
Managing people is an art.
Get the best of both, worldwide, with the IBM System/38 or AS/400 and Financial and Human Resources Management systems from Software 2000.

- The Human Resources 2000 Series
- The Financial Management 2000 Series
- Application Manager 2000: The AS/400 Platform of Choice

Software 2000

Mainframe Caliber Software for the IBM Midrange

Software 2000, Inc.
One Park Center • P.O. Box 6000
Hyannis, MA 02601
(800) 525-0490

• ATLANTA • BOSTON • CHICAGO • DENVER • HYANNIS • LOS ANGELES • LONDON •

IBM and AS/400 are trademarks of International Business Machines Corporation.

Prospeed

FROM PAGE 53

cessing power, with the option of a fat, fast hard drive and a clear backlit white screen with black letters. The battery pack (4.6 pounds) reportedly provides one to two hours of operation.

The interior of the system is well-made. It uses surface-mount and integrated chip sets and shows no last-minute patchwork.

NEC offers a one-year warranty on this unit. Support is available toll-free. The NEC technicians, although easy to reach, are limited in their knowledge of the product.

According to NEC, the Prospeed Modular PC is a portable and desktop computer in one — for a lot less money. Based on list price, NEC's claim is true. With 2M bytes of RAM and a 40M-byte hard drive, this system lists for $7,598. So the desktop/portable combination is less expensive than owning one of each — and more convenient.

NEC Home Electronics, 1255 Michael Drive, Wood Dale, Ill. 60191. 800-826-2255.

Barney

FROM PAGE 51

forever to arrive.

What, then, would a Microsoft-oriented IS shop look like several years from now if the things discussed by Microsoft today are made available in a useful form and put to work?

A Microsoft shop would have two key components. Its applications software would be very graphical, perhaps elegant, and definitely very expensive. The PCs would have Intel 80486 processors (maybe more than one), true multitasking, high-resolution color graphics, loads and loads of fast 32-bit memory and a king-size hard disk or optical drive. Sort of like a Macintosh on steroids.

These PCs would run Presentation Manager-based applications that are tied directly to SQL Server, where users could store raw data, text and images. The PCs would be tied together via LAN Manager so employees could share data and gossip electronically. These machines would all be modified with a new version of Basic that serves as a super batch and macro language for multitasking systems. There might even be a Macintosh or two around (but no Next machines!).

MICROSOFT has been trying to sell individual users on the strategy, and most of them think SQL is some kind of food additive.

It is not a bad strategy for a well-heeled IS organization. Unfortunately, Microsoft has been trying to sell individual users on the strategy, and most of them think SQL is some kind of food additive.

This overall system is a pure IS sell. It is IS that can specify the proper hardware and make sure it is consistent throughout the shop. They are also the only ones that can truly understand SQL Server, which is a purely mainframe-style database that happens to run on a micro.

Because of its focus on individuals, Microsoft does not have all the pieces that IS requires. An effective connectivity strategy to host computers has not been high on Microsoft's list, nor has the PC-centric firm embraced IBM's Officevision with any rampant enthusiasm.

Microsoft's applications strategy has also neglected Unix, an item that ranks high on the IS wish list. This despite that fact that Microsoft has a hand in various Unix operating system offerings, including its own Xenix, AT&T's Unix 386 and OSF/Motif. This stubbornness, which many view as an attempt to protect the floundering OS/2, may not sit well with IS pros who seek choice.

In an ideal world, Microsoft's applications group would be aligned with a mainframe-oriented player. This way, Microsoft applications would communicate efficiently with hosts and would even share the processing burden. All this, however, requires a change of focus for Microsoft, which pays most attention to individual PC users and PC technology. In fact, if the firm's distribution strategy does not change dramatically, the Microsoft shop may end up buying all these complicated products from a computer retailer, who knows nothing about SQL, CICS or IS.

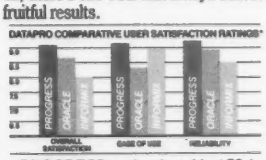
So far, Microsoft has had a fine strategy for growth. But without some changes in product and mind-set, this approach might not cut it in IS organizations of the future.

Congrats, Steve! Steve Ballmer, head of Microsoft's system software and a marathoner, has a new item to add to his resume. The high-energy guru of DOS, Windows and OS/2 is getting hitched to Connie Snyder, a key member of the Microsoft public relations team at the Waggener Group. Our sources point to March 31, 1990 as the day, but knowing software companies, it could be much later.

Barney is editor in chief of *Amiga World*.

Finally, A 4GL That Can Thrive In Any Corporate Culture.

Regardless of the corporate environment, regardless of the application, regardless of the hardware you're working on, there's one 4GL that always delivers fruitful results.



PROGRESS, truly adaptable 4GL/RDBMS software that organizations like The Dannon Company, Sherwin-Williams, and Marriott Corporation rely on to perform miracles every day.

A 4GL that's used in fields as diverse as manufacturing, health care, and bond trading. That topped the Datapro ratings of 4GLs two years running (see chart). And one that lets you easily produce reports, perform queries, and paint screens.

What's more, PROGRESS comes with automatic crash recovery and ANSI-standard SQL. And because you write everything in our 4GL, you're guaranteed portability across VAX/VMS, MS-DOS, UNIX, CTOS/BTOS, and networks.

So call to test-drive a complete evaluation copy of PROGRESS, and ask about our Demonstration Video.

It's one 4GL that will suit everyone's taste.

That's PROGRESS®
1-800-FAST-4GL
In Massachusetts, (617) 275-4500

© 1988, Progress Software Corporation, 5 Oak Park, Bedford, MA 01730. PROGRESS is a registered trademark of Progress Software Corporation.
*Compiled from the most recent Datapro 70 Reports on Software. VAX/VMS, MS-DOS, UNIX, and CTOS/BTOS are trademarks of their respective manufacturers.

Software-only Freestyle/Light on tap

BY MARYFRAN JOHNSON
CW STAFF

LOWELL, Mass. — Borrowing a bit of whimsy from the beer industry, Wang Laboratories, Inc. recently introduced "Freestyle/Light," a software-only, $249 version of its original Freestyle system.

The company also slashed prices for the original Freestyle package from $1,995 to $995 for the tablet, pen and software. The voice option dropped from $1,495 to $795, and the facsimile option went from $1,595 to $595.

"Manufacturing efficiencies, market research and customer feedback" all served to pull prices down, said Karen Brooks, marketing manager for Wang's personal computer-based information management and communication tool.

Controlled by a keyboard or mouse, the Freestyle/Light package unbundles the original version of Freestyle. The new software is freed from its Wang-only platform and will run on industry-standard PCs with 640K bytes of memory and 20M-byte hard disks.

"This tells me Wang is listening to its customers," said Ann Palermo, director of office systems research at International Data Corp. in Framingham, Mass.

"Wang would do well to consider this product a loss leader, to establish itself in new accounts and demonstrate that it has clearly superior and unique technologies," said Chris Christiansen, director of midrange strategies for Meta Group, Inc. in Westport, Conn.

The new product allows users to create and annotate Freestyle pages and manage the Freestyle electronic desk through their PC keyboard or optional mouse. Both versions of Freestyle now work with color IBM Video Graphics Array displays, as well.

Drawing and longhand writing are possible through use of the mouse, but the Freestyle tablet and pencil must be purchased as an add-on option. The price of that option is still undetermined for the new version, a Wang spokeswoman said.

Through Wang LAN Office, Freestyle/Light users can share information with other users via industry-standard local-area networks such as Novell, Inc.'s Advanced Netware or IBM's Token-Ring.

Jay A. Martus, a lawyer with the Miami firm of Steel Hector & Davis, said the appearance of Freestyle/Light should help sell more of the original Freestyle.

Steel Hector & Davis was the first site to install Freestyle, which began shipping last spring. Martus said the firm has dramatically changed the way paper is handled in its business. "You save so many steps with Freestyle. Instead of tracking somebody down, you can image in a document, drop it into an icon and distribute it by fax, modem or E-mail," Martus said.

Sun

CONTINUED FROM PAGE 51

financial applications on Wall Street.

Analysts said that could have been a foolish move, particularly in the diverse Unix marketplace. "The Unix DBMS market is very fragmented and with no clear winner," said David Card, an analyst at the International Data Corp. research firm. "So instead of going with one, Sun went with the current standouts."

The alliances — along with machines such as the Sparcstation and additions such as the Open Look user interface — are integral to Sun's effort to expand beyond its stronghold in the engineering and scientific fields. "The DBMS market is absolutely critical in helping us to become a multibillion-dollar company," said Nancy Colwell, Sun's marketing manager for database and application development.

Although the four DBMS vendors are fierce competitors, the various pacts are a business necessity. "If Sun had recommended one product and it wasn't us, we would have been forced to not recommend Sun products to our customers," said Chris Hurt, senior manager of Unix marketing programs at Oracle.

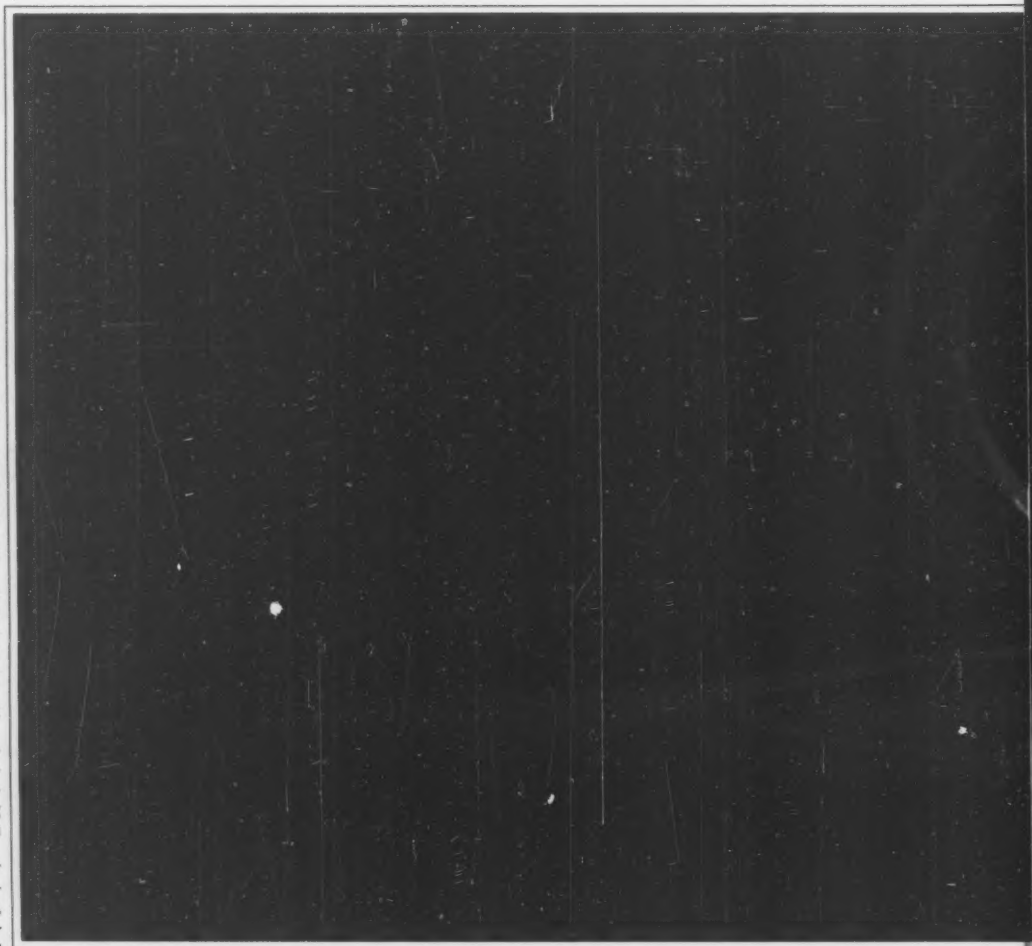
All four companies gain high-level access to Sun development and management teams. Sun has dedicated an engineer to each vendor so that the upcoming products will be tightly integrated with Sun platforms.

Sun engineers will work with their DBMS vendor counterparts on joint product development, performance tuning, early release testing and quality assurance. Sun will also allow the vendors an early peek at upcoming versions of their SunOS operating system.

Sun officials now admit they face the ticklish task of not appearing to play favorites. "Each of the firms is looking for information on the other, but we're not going to play kiss and tell," Colwell said.

Colwell said they would make sure that any future tweaking of the operating system will cause good, not harm. "We will do some changes that help only one but not the others, but we won't do any changes that will hurt anyone," she said.

Sun said it has also forged "strong relationships" with other leading vendors, including Information Builders, Inc., Interbase Software Corp., Natural Language, Inc. and Unify Corp.



The World Of Information Management Has Changed For Good.

In the next 24 hours, businesses and government organizations in America will generate over 900 million pages of information. They will have stored approximately 1.3 *trillion* documents. And misfiled about 39 million.

Every day, the paperwork crisis is getting bigger. And more complex. Paperwork is no longer limited to processing words and numbers. It now encompasses text, pictures, charts, tables, maps, line art and even hand-written notes.

That's why every organization needs BASISplus,™ the new generation Text Information Management System (TIMS) that turns information in any format into useable "assets" by putting immediate, enterprise-wide access into the hands of people who can apply it productively.

And no system is as comprehensive as BASISplus. With a relevant term, phrase, or concept, its content-based retrieval capabilities let you access *all* appropriate documents in seconds.

BASISplus is the only TIMS with an advanced window-based graphical user interface. Now all users — even casual users — can have access to the information that makes them more productive and efficient.

Only BASISplus supports compound document architecture, giving all users information as they are accustomed to seeing it — "true form" information

BASISplus is a registered trademark of Information Dimensions, Inc. DEC is a registered trademark of Digital Equipment Corporation. IBM is a registered trademark of International Business Machines Corporation. CDC is a registered trademark of Control Data Corporation. Wang is a registered trademark of Wang Laboratories, Inc. Unisys is a registered trademark of Unisys Corporation. AT&T is a registered trademark of American Telephone and Telegraph Company.

Hypertext conference goers tout open systems approach

BY LIORA ALSCHULER
SPECIAL TO CW

PITTSBURGH — Hypertext developers are turning away from the elusive individual goals of developing *the* standard application and are embracing the idea of subapplication hypertext utilities and components that would allow the interchange of data between applications.

Some 650 system developers and users who met at the Hypertext '89 conference, sponsored by the Association for Computing Machinery, were greeted by declarations that proponents of hypertext — the concept of providing free-form clumping of various data — should follow the open systems trend sweeping other areas of the computer industry.

"Today's monolithic hypermedia systems are compelling, reasonably easy to build and design and doomed to failure," said keynote speaker Norman Meyrowitz of the Institute for Research in Information and Scholarship at Brown University.

While some closed systems — Meyrowitz's own Intermedia among them — continue to add features, he and other developers said the need for system-level integration should take precedence over insular hypertext.

Frank Halasz, a developer of the Notecards system at Xerox's Palo Alto Research Center, said today's integrated environments require open, not monolithic, systems. Developers, he said, should program the hypertext interface as an "add-on" and provide database and indexed support. He said: "Notecards is on its way out, and we need to replace it."

Greg Kimberly of Apple Computer, Inc. said Apple's Hypercard grew out of a file-card metaphor. Although Apple's product is one of the most well-known, he called it a "Rolodex on steroids."

Seeing hypertext as a layer between the operating system and the application has several benefits, speakers said. Users would be able to continue using their familiar word processors, spreadsheets and databases but would also be able to pull in or point to sections of data from other applications or other platforms without losing the context or structure of each type of data.

Neither Microsoft Corp.'s Dynamic Data Exchange nor Sun Microsystems, Inc.'s Link Service were conceived as hypertext, but these, along with Apple's announced System 7.0 for the Macintosh, were referred to as open hypertexts functioning below the application level.

The movement toward open systems has tremendous "grass roots" support from outside the major system developers. Developer Michael Bieber of Boston College said that he views hypertext as a system-level tool or gateway to applications, not as an application itself.

At Baylor College of Medicine in Houston, researchers looked at Notecards and Knowledge Workshop's KMS but concluded that to use these systems, they could not use the platforms and applications already in place, according to staffer G. Anthony Gorry.

Introducing BASISplus.

that's more meaningful and easier to apply.

BASISplus stands at the frontier of established document interchange standards support. It eases the loading of any information or documents that conform to these accepted standards.

BASISplus' client server architecture works efficiently in virtually all mainframe and mini environments, including DEC, IBM, CDC, Wang, Unisys, AT&T and more, so it is compatible with whatever you're using now. And with whatever you're likely to acquire.

BASISplus was developed by Information Dimensions, the world's leading TIMS vendor. Information Dimensions has already helped over 1600 private and public organizations improve their information management capabilities. We have the people, the resources, and the dedication to quality and customer satisfaction that assure a continuing return on your TIMS investment.

You have to see BASISplus in action to appreciate its potential for accelerating your organization's success. For more information or to arrange a demonstration, call toll-free 1-800-DATA-MGT (in Ohio, call 614/761-7300 collect).

Information Dimensions
a BATTELLE Subsidiary

Steel

CONTINUED FROM PAGE 51

plaints with the frugality. "It's a pride thing — we can do a better job for less," said Steve Holcomb, the company's technical services manager.

"It's easier to do things with a smaller number of people to deal with and fewer layers of management," added Robert Perry, systems programming manager.

Despite the money and time savings generated by the switch from PDPs to PCs, there are stumbling blocks to the conversion.

Networking is the main obstacle. Monroeville, Pa.-based Applied Sy ems Associates, Inc. (ASA) developed the production software, called ASA/Basic Rebar System, for the DEC platform, which Florida Steel has used for more than 10 years (the firm's homegrown office automation programs run on an IBM 4381 P13 mainframe located at its headquarters).

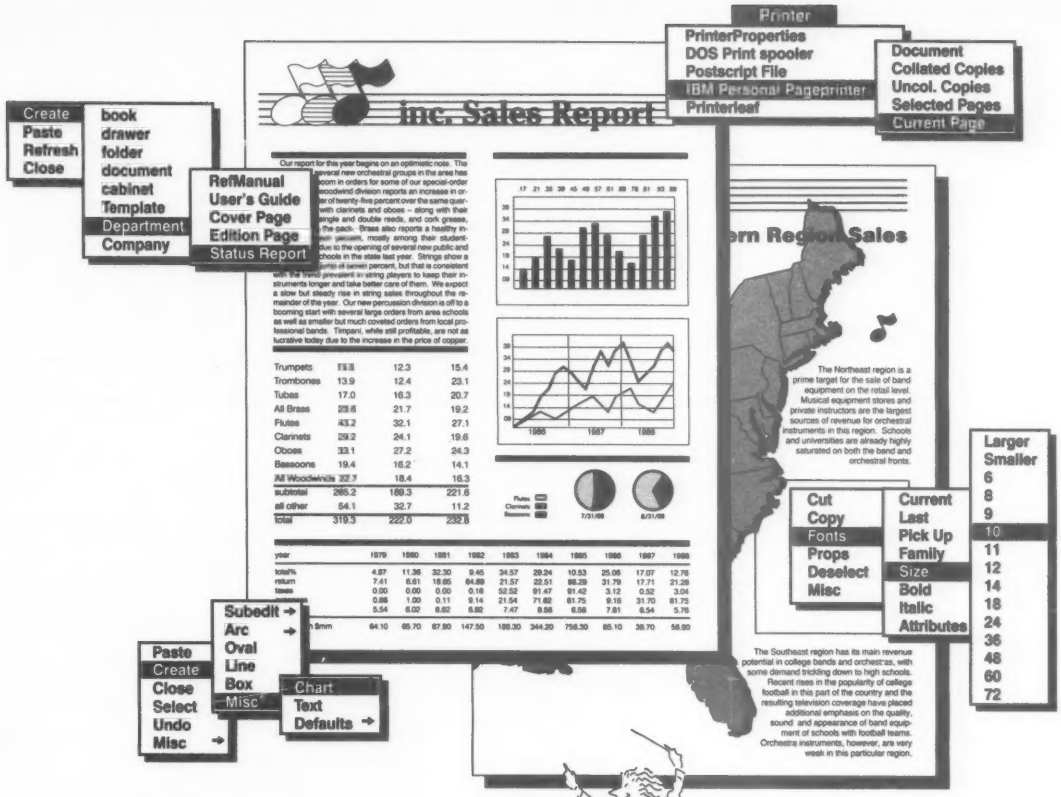
Two years ago, ASA converted the program to run on PCs, but it is still working on a method of putting the program on a network — possibly an Ethernet-like network, an ASA official said.

Currently, data files must be swapped among the nine PCs that fill the role of the PDP at the Washington plant. But when the network is installed, possibly this spring, the users will be able to share data files electronically and work on them simultaneously.

Little also foresees a potential need for more powerful, Intel I486-based machines for his engineering staff. In the meantime, the company is taking things slowly. "The time frame for conversion depends on each division, on how comfortable they are with what they have and what their work load is," Hennessey said.

"We have a big investment in the DEC equipment," Little noted. "But as technology improves and the need for faster processing mounts, as I see it there's no choice but to go to the PC."

Why settle for a single player,



when you can have the whole orchestra?

IBM Interleaf Publisher. The desktop publishing ensemble that does it all.

Until now, most desktop publishing software played only one tune. Some performed page layouts. Others executed graphics. Then there were the word processing virtuosos. And the charting soloists.

But now there's IBM Interleaf™ Publisher. It performs *all* these functions, and makes them work together in concert. So all you need is one desktop publishing instrument to do the work of many. What's more, the critics agree Interleaf does it all better and faster than the packages that only play solo. Which makes you more productive, whether you work alone or with others, on anything from simple memos to fully orchestrated publications. Especially when you add the power and speed of any 386™-based IBM PS/2® and the great-looking results you get with an IBM laser printer.

Pop-up menus that let anyone play like a pro. Practice, practice, practice? Not with IBM Interleaf. Its pop-up menus lead you through any task. So you're free to improvise. Create. Even show off a little. And if you want to change your tune, that's easy, too. Start with a spreadsheet, and transform it into a pie chart, then to a bar chart, then to a line graph—instantly.

If all this sounds like an overture you can't refuse, contact your IBM marketing representative or IBM Authorized Dealer and ask about IBM Interleaf today. To find the dealer nearest you, call 1 800 IBM-7257, ext. 146. And get ready for the applause.

IBM®

IBM and PS/2 are registered trademarks of International Business Machines Corporation.
Interleaf is a trademark of Interleaf, Inc.
386 is a trademark of Intel © 1989 IBM Corp.

NEW AT COMDEX/FALL '89

The following products were recently announced at Comdex/Fall '89 in Las Vegas:

• An Intel Corp. 80486 Micro Channel Architecture system was unveiled by American Mitac Corp. in San Jose, Calif. Designated the MPS5000F, the machine can be used as a high-end personal workstation, a local-area network hub or as a multiuser work group host, according to the company.

The product's on-board cache is reportedly complemented by a secondary 128K-byte cache with two-way associative cache management capabilities. The system is configured as a 25-MHz floor-standing unit, which incorporates space for six half-height mass-storage devices. It offers a 64M-byte random-access memory (RAM) capacity, which will run under several operating systems, including DOS, OS/2 and The Santa Cruz Operation's SCO Xenix 386.

A 4M-byte RAM version, including MS-DOS 4.0, is priced at $8,995.

• Accell Computer Corp. in Irvine, Calif., announced the Erasable Optical Disk Drive. Designed specifically for Apple Computer, Inc. Macintosh computer users, the product can reportedly accommodate 650M bytes of data on a rewritable optical disc and is especially suited for computer-aided design, engineering and manufacturing (CAD/CAM/CAE) multiple-image applications. According to the firm, it can also be used as a storage device in a LAN's operating server system.

Pricing has been set at $4,995.

• A 14-in. color monitor with 1,024 by 768 dot/in. noninterlaced resolution capabilities was introduced by Princeton Graphics Systems in Roswell, Ga. The Ultra II supports IBM's Video Graphics Array (VGA) technology and was designed for both graphics- and windows-based applications, as well as desktop publishing environments, the firm said. Scheduled for release by the end of 1989, the monitor supports the IBM Personal Computer, Personal System/2 and compatibles, and Apple's Macintosh II system.

Retail pricing is $1,295.

• Merrill & Bryan Enterprises, Inc. in San Diego unveiled Version 5.0 of the company's Turbo EMS software program. The product eliminates the 640K-byte RAM limit of any MS-DOS computer, the vendor said, while adding Intel 80386 memory-management capabilities to any IBM PC, PS/2 or compatible 80386-based machine. The software was created to aid the user in relocating device drivers, application code, network shells and terminate-and-stay-resident programs. The latest release carries a suggested retail price of $99.95.

• Boca Research, Inc., based in Boca Raton, Fla., introduced the 1024VGA by Boca board. The unit reportedly offers a 1,024 by 768 dot/in. resolution, 16-bit VGA performance and is priced at $395. Shipments are scheduled to begin by mid-December. Due to the stability of RAM chip costs, the company was also able to announce a 32% price decrease for seven of its existing IBM PC- and PS/2-compatible add-in memory boards.

• A 21-in. color monitor featuring a 1,280 by 1,024 dot/in. resolution was introduced by Nissei Sangyo America Ltd. Designated the CM2186F, the product features a .28mm dot pitch and is aimed at desktop publishing and CAD/CAE markets. It offers a flat-screen, antireflective panel. The unit costs $3,795.

NEW PRODUCTS

Systems

Advanced Logic Research, Inc. has announced a 33-MHz microcomputer that utilizes the IBM Micro Channel Architecture.

The Microflex 3300 is available in five models and incorporates the company's Flexcache technology to provide a 64-bit-wide data path and 128K-byte external cache memory. The unit also features an MCA-compatible IBM Video Graphics Array adapter and supports a 640-by 480-pixel resolution in 16 colors. An optional Enhanced Graphics Package upgrade is available to provide 1,024- by 768-pixel resolution.

All versions come standard with 2M bytes of 60-nsec. memory, expandable to 64M bytes using an expansion card. Two chassis styles are offered, and a small footprint is available with the Models 70 and 120.

Pricing starts at $5,795.

Advanced Logic Research
9401 Jeronimo
Irvine, Calif. 92718
714-581-6770

ICL North America Office Systems has introduced a workstation that can be used as a standalone DOS processor or in an integrated, personal computer-to-Unix minicomputer network environment.

The DRS Model 40 is based on the Intel Corp. 80286 chip and was designed to be functionally compatible and price competitive with IBM's Personal System/2 Model 30, the company said. The system runs under MS-DOS Version 3.3 at 16 MHz and offers 1M byte of on-board random-access memory and as much as 40M bytes of hard disk storage. Pricing starts at $1,895.

ICL North America
P.O. Box 19593
Irvine, Calif. 92713
714-458-7282

Software applications packages

A visual database for drawings for the IBM Personal Computer AT, XT, Personal System/2 or compatibles is available from Image Systems Technology, Inc.

Called Viewbase, the software reportedly archives image collections using keywords and automatic search techniques to find and display drawings. According to the company, the condensed raster images can be stored on a variety of media including hard drives, compact disk cartridges and optical disks. The program is said to require DOS 3.0 or higher and 512K bytes of random-access memory. The list price is $1,000.

Image Systems Technology
165 Jordan Road
Rensselaer Technology Park
Troy, N.Y. 12180
518-283-8783

Dac Easy, Inc. has announced Version 4.0 of the Dac Easy Accounting series.

The company reports that Version 4.0 includes pull-down menus, mouse control, on-line help and modules for such procedures as General Ledger, Accounts Receivable, Accounts Payable and Billing.

The price is $149.95.

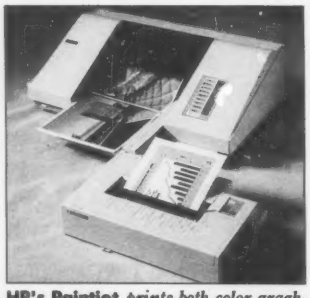
Dac Easy
Suite 800
17950 Preston Road
Dallas, Texas 75252
214-248-0305

A graphics package for creating and retouching images has been introduced by Zsoft Corp.

Paintbrush IV Plus reportedly provides built-in scanner control and large-scale image support. Features include blend, smudge, gradient, tiling, tint, brightness and contrast functions, as well as multilevel zoom capabilities. Priced at $199, the software is targeted at desktop publishers and business presentation users and runs on IBM Personal Computers and compatibles with MS-DOS 3.0 or higher. A drawing device is also required.

Users of PC Paintbrush Plus may obtain an upgrade for $50, and owners of PC Paintbrush IV can upgrade for $69.

Zsoft
Suite 100
450 Franklin Road
Marietta, Ga. 30067
404-427-1150



HP's Paintjet *prints both color graghics and text*

Peripherals

A color-graphics printer aimed at business and technical professionals who want to print color graphics and text with a single device has been unveiled by Hewlett-Packard Co.

The HP Paintjet XL was designed to work with the IBM Personal Computer and compatible systems as well as the Apple Computer, Inc. Macintosh family. It supports Microsoft Corp.'s Windows environment.

The thermal ink-jet device reportedly accommodates both 8.5- by 11-in. and 11- by 17-in. media sizes and offers an optional cartridge with 20 additional fonts. It provides a 180 by 180 dot/in. resolution and can produce up to 16.7 million shades of color. The Paintjet XL is priced at $2,495. The HP Color Printkit for Apple Macintosh computers costs $125. A one-year warranty is included.

HP
3000 Hanover St.
Palo Alto, Calif. 94304
800-752-0900

Two computer monitors designed for applications requiring large-screen, high-quality resolution techniques are now available from Nanao USA Corp.

The 21-in. Flexscan Model 6300 is a grey-scale multiscanning monitor capable of displaying side-by-side paper white images of two complete pages, the vendor said. The unit supports resolutions to 1,664 by 1,200 dot/in. and costs $1,989.

The Flexscan Model 9400 is reported to be a 20-in. multiscanning color monitor with display resolution capabilities to 1,280 by 1,024 dot/in. It is priced at $3,799.

Nanao USA
Suite 5
23510 Telo Ave.
Torrance, Calif. 90505
213-325-5202

Texas Instruments, Inc. has unveiled a printer compatible with the Hewlett-Packard Co. Laserjet II that can be user-upgraded as needed.

The Microlaser can be purchased as a basic, 6 page/min. printer with 512K bytes of memory and then upgraded to an Adobe Systems, Inc. Postscript-compatible printer with 4.5M bytes of memory. This upgrade is done by installing memory, interfaces or interpreters directly onto the printer controller board.

The price of the Microlaser is $1,999. A Postscript upgrade board is available for $505.

Texas Instruments
Information Technology Group
P.O. Box 202230, ITG-002
Austin, Texas 78720-2230
1-800-527-3500

Utilities

Synex has announced an update to its phone directory program for Apple Computer, Inc. Macintosh computers.

According to the company, Macphonebook 2.0 can import phone numbers from any database or word processor, then sort them into user-defined categories.

The user can then print them as an in-house directory, in a checkbook-size format or in the original little black book format.

Macphonebook 2.0 is available for $79.95

Synex
692 Tenth St.
Brooklyn, N.Y. 11215-4502
718-499-6293

Gibson Research Corp. has reportedly extended its hard-disk utility program to operate with MS-DOS partitions of any size.

According to the vendor, Spinrite II offers preventive maintenance for hard disks of any capacity and reports all findings and activities by file and offset, MS-DOS partition relative and absolute drive physical locations.

The product includes a 5.25-in. diskette and an operator's guide. The price has been set at $89.

Gibson Research
22991 La Cadena
Laguna Hills, Calif. 92653
714-830-2200

Personics Corp. has announced a software package that will allow users to double, triple or quadruple the number of cells currently displayed by Lotus 1-2-3 Versions 2, 2.01 and 2.2.

Users can reportedly use Seemore to choose the number of cells to view then zoom in or out with a single key.

The announced list price for Seemore is $99.95.

Personics
63 Great Road
Maynard, Mass. 01754
508-897-1575

DATA STREAM

Bruce Page

Prepare the way for EDI

With all the recent emphasis on "connectivity," one area has been overlooked: creating electronic interfaces between corporations and their customers, suppliers and the general public.

The rising popularity of electronic data interchange (EDI) is based on the fact that in general, corporations pour about 7% of their yearly expenditures into such administrative functions as sending invoices, processing sales orders and so forth. EDI, pundits claim, can save up to half of these costs.

Unfortunately, EDI standards and the electronic infrastructure to support them have been slow in coming. Yet, many of the benefits of EDI may be realized today through the use of microservers, or personal computer-based communications gateways. France developed microservers as part of its ambitious and successful national

Continued on page 64

Inside

- Comdisco builds backup backbone net. Page 64.
- IBM unveils Programmable Network Access. Page 65.
- Novell offers LAN-to-LAN upgrades. Page 72.

Green Giant axes aging Bull

ON SITE

BY ELISABETH HORWITT
CW STAFF

MINNEAPOLIS — Pillsbury Co. has moved the management of its Green Giant Co. vegetable business down from Honeywell, Inc. DPS 6 minicomputers to IBM Personal System/2s on a local-area network.

The two major reasons for its decision are escalating minicomputer hardware and software maintenance costs and an overall corporate direction toward "making each and every facility more autonomous and accountable," according to Randy Haney, a consultant at Bios, Inc. in Minneapolis, who managed the project.

More than a year ago, Pillsbury began the process of evaluating alternatives to the aging Honeywell — now Bull H. N. Information Systems, Inc. — minicomputers it had been using for eight to 12 years, Haney said. In addition to a LAN-based system, the company considered the possibility of migrating to another type of minicomputer, either from Bull or another vendor. Hewlett-Packard Co. was a strong candidate, Haney said, because other parts of Pillsbury use HP systems. The firm also evaluated the idea of "just doing everything remotely, with terminals hooked up to the corporate mainframe," Haney said.

Pillsbury settled on a LAN-based platform last November and by February had chosen the particular products to be used. The workstations are IBM PS/2s, primarily Model 30s and 70s, running MS-DOS; the file servers are from Wyse Technology, Inc. The network operating system is Novell, Inc.'s Netware; the LAN boards are 3Com Corp.'s Etherlink. Each LAN would support between six and 30 workstations, Haney said.

Perhaps the most crucial component of the system, however, was the data entry package that would bring information into the PS/2s and batch it up to corporate IBM mainframes. The package would be used for "the whole gamut" of applications, including accounting, payroll, inventory control, invoicing and purchase orders, Haney said.

Pillsbury eventually chose Datalex, Inc.'s Entrypoint 90. The major reason for its choice was the tools and support Datalex provides: It wanted to convert some 200 forms from the format used by Bull's DEF II data entry package so that the system would be up and running by last September.

By the first quarter of next year, Pillsbury hopes to have installed Novell's X-Multi, a combination bridge and gateway that will connect the 50 to 60 LANs throughout the company to one another and also link them to IBM and Honeywell hosts,

Continued on page 65

Curtain call on the way for central-office LANs

ANALYSIS

BY JOANIE M. WEXLER
CW STAFF

With the proliferating array of options for data connectivity, the central-office local-area network (CO LAN) may be going the way of the vacuum tube.

Although there is a fairly well-defined set of users for whom switching data through the central office currently makes economic sense, the emerging, higher speed Integrated Services Digital Network (ISDN) Centrex alternative may soon elbow the CO LAN off user lists as a connectivity consideration.

CO LANs typically integrate voice and data over a single pair of copper wires through voice/data multiplexers installed under each workstation at the customer's site. The data and voice signals are separated and switched at the central office for a per-line monthly fee.

CO LAN users tend to be organizations with multiple sites in a limited geographic area that do not have heavy file transfer needs. These users typically have weighed the merits of CO

Continued on page 68

The dawn of MAN

A central-office local-area network can be used as a "LAN bridge" to link individual private networks and is most successful in areas where a 56K bit/sec. data rate can minimize the bottlenecks related to linking private networks.

A higher-performance alternative for linking LANs in a metropolitan area is the broadband metropolitan-area network (MAN). MANs, which are offered by both local-exchange carriers and bypass companies, generally run on fiber or digital microwave facilities. "If users are attempting high-bandwidth applications, such as CAD/CAM, they are probably better suited to a MAN," noted Randy Cook, product manager at Bellsouth Services, Inc., a regional holding company.

According to a bulletin issued last month by International Data Corp., MANs are strategically important because they address the traditional "last-mile" communications bottlenecks by providing multi-megabit/sec. connections directly to the customer's premises.

JOANIE WEXLER

New Version!

Zero Learning Curve

SPF/PC® 2.1

The MVS programmer will feel right at home using SPF/PC, the only PC editor functionally equivalent to editing on the IBM mainframe with ISPF/PDF, Release 2, Version 2.

SPF/PC fills the mainframe user's needs with a familiar environment, commands, large file support and micro-to-mainframe file portability. SPF/PC also offers:

- *true split screen*
- *command stacking*
- *43-line EGA*
- *picture strings*
- *online help*
- *binary editing*
- *directory/member lists*
- *hexadecimal editing*
- *50-line VGA*
- *user interface*
- *utilities*
- *network support*

SPF/PC includes many PC-productivity features to save time and keystrokes, such as direct access to BROWSE and EDIT directory lists from the DOS prompt.

Want proof? Ask us for a FREE, interactive demonstration diskette.

SPF/PC — so much like the real thing, you'll forget you're editing on a PC.

CTC®
Command Technology Corporation

1900 Mountain Blvd., Oakland, CA 94611 (415)339-3530
Orders: (800) 336-3320 *FAX:* (415) 339-3883 *Telex:* 509330 CTC

Page

CONTINUED FROM PAGE 63

videotex program, and the products are starting to appear over here as well.

Many companies in France now use microservers to accept sales orders, and some mail-order companies receive more than half their orders on-line. These companies have estimated the cost of taking an order over the phone at about $2.50. Use of a microserver is said to drop the cost to less than 50 cents.

With the microserver, these companies have created simple on-line systems that hide many of the complexities of traditional applications. In doing so, they have increased the percentage of their work force that uses information systems — and increased the efficiency of their businesses in the process. More than 10,000 French companies now operate their own Minitel-based data communications services, and some 6,000 more plan to add their own services this year.

Today, microservers are available from two companies in the U.S.: Baseline Corp. in New York and Servotel in Palo Alto, Calif. With a rich applications development environment and prodigious communications gateway capabilities, microservers offer U.S. corporations one way to begin automating their links to customers and suppliers now, before EDI is widely implemented. And when EDI standards for various industries finally do arrive, it will be a simple matter of tweaking the microserver program to conform to the EDI specifications.

Railroading information

In general, any repetitive, telephone-based task can be efficiently handled by a microserver (or several of them). An outstanding example is provided by the French national railroad system, which handles more than 20,000 information requests per day by means of its on-line videotex reservations and information system — a task that would otherwise require it to hire more than 300 telephone operators.

Microserver software has three principal elements: the communications interface, the system monitor and various applications modules. In the communications module, the serial outputs of the host microcomputer are processed for communications with internal (local-area network) or external (public telephone or X.25 packet-switched) data networks. The system monitor allocates the computer's memory and disk resources, oversees user passwords and security levels and directs traffic within the system. Applications modules run specific services such as electronic mail, data entry (e.g., for order taking) and database access.

Supplementary programs, such as page-composition software and editors, complete a microserver system.

The key to microservers is the assumption that the more people there are using a computer system, the greater its overall benefit will be.

"Usage is everything," said Daniel Leclercq, chief engineer for France's videotex program. "If computer systems do not work, it's because people do not use them."

Page is president of Magnetic Press, Inc., a New York-based research firm specializing in communications technologies.

Backup net from Comdisco

BY JEAN S. BOZMAN
CW STAFF

ROSEMONT, Ill. — Comdisco Disaster Recovery Services, Inc. (CDRS) recently said it is building a backbone network that will allow its subscribers to bypass their local telephone company and re-create their own corporate network in the event of a disaster.

CDRS Net is intended to expand the firm's $100 million business by adding new network services for its customers, many of which are Fortune 500 firms with multiple sites. The move also leverages Comdisco's 10-year, $300 million investment in 26 data center hot sites and 20 preconditioned "shell" sites in the U.S. and Canada.

"We can take a customer that is based in Atlanta and allow that customer to transparently access any computer recovery facilities we have," said Richard Zane, president of CDRS North America. "We're providing network redundancy, as well as computer redundancy."

The CDRS network will support both T1 and T3 high-speed data lines and access to hardware platforms throughout the network. Among these are IBM mainframes, Digital Equipment Corp. computers and computers made by Tandem Computers, Inc. and Unisys Corp.

However, customers should be prepared to bring along in-house expertise, as well as the CDRS monthly subscription fee of $2,000 to $30,000 per month and the new networking service fee, based on required capacity.

"The customer is going to bring in his network configuration, including such things as IBM's Netview network manager," CDRS President Raymond Hipp said. "For our part, we're making our system protocol-independent. It has to be transparent to the user."

CDRS has contracted with AT&T to bring AT&T and MCI Communications Corp. voice and data lines into eight regional CDRS centers through a Network Services Gateway.

When the mission is critical, leaders plug into BTOS workstations.

UN

Unisys is a registered trademark of Unisys Corporation.
BTOS is a trademark of Unisys Corporation.
Nationwide is a registered service mark of Nationwide Insurance.
ORACLE is a registered trademark of ORACLE Corporation.
Informix is a registered trademark of Informix Software Inc.
MS-DOS is a registered trademark of Microsoft Corporation.
PROGRESS is a registered trademark of Data General Corporation.
©1989 Unisys Corporation.

IBM extends packet-switched capability

BY ELISABETH HORWITT
CW STAFF

WHITE PLAINS, N.Y. — IBM strengthened its commitment to multivendor, packet-switched networking recently with the introduction of Programmable Network Access, software that is said to convert an IBM Personal System/2 into a combination Systems Network Architecture (SNA) and X.25 concentrator.

The product addresses large IBM customers "who have a multiplicity of networks" that need to be connected over an SNA or X.25 backbone, said IBM spokesman Jack Baney. PNA "protects their [SNA] investment but also shows our realization of [customers' tendency to have] multivendor networks."

A PROGRAMMABLE interface allows users to provide support for whatever types of terminals have been installed.

The first PNA release provides concentration of data traffic from multiple SNA and non-SNA terminals onto a single Synchronous Data Link Control backbone network. The second release can also act as an X.25 and packet assembler/disassembler that provides protocol and data stream conversions for ASCII terminals, allowing users to access both SNA and X.25 connections, IBM said.

A programmable interface allows users to provide support for whatever types of terminals have been installed, an IBM spokesman said. In addition, a PS/2 running the program can act as a local gateway between user workstations at the same site, preserving local operations even when the X.25 network goes down, the spokesman said.

A PS/2 configured with PNA can also collect alarms from SNA devices and monitor the lines out to non-SNA devices, IBM said. The concentrator can then forward alerts up to IBM's host-based network management system, Netview, or store them on a local disk. A programmable interface allows users to add on other non-SNA devices.

A PS/2 running PNA Version 1.0 can support up to 32 lines at speeds of up to 19.2K bit/sec., with a future Version 1.1 supporting speeds of up to 64K bit/sec., IBM said. The program will run on either Microsoft Corp.'s OS/2 Standard Edition or IBM's OS/2 Extended Edition and Real Time Interface Coprocessor hardware. Priced at $2,000, the product is scheduled for availability next June.

If your business relies on interactive distributed processing to deliver critical applications, Unisys BTOS workstations aren't just another interesting technology to consider, they're a necessity.

BTOS workstations have been proven as the system of choice since 1982 at such leading companies as Nationwide Insurance, HongkongBank, and Yamaha Corporation of America. Productive, practical and dependable, BTOS systems fill a vital niche in their business transaction processing environments.

Designed specifically for concurrent connectivity, using industry standard protocols like SNA, TCP/IP and OSI, BTOS workstations communicate with multiple systems simultaneously.

Built-in system networking gets each new workstation instantly on-line as soon as it's plugged in. You can easily share applications and peripherals, data and electronic mail.

The operating system handles multiple applications simultaneously including ORACLE, Informix, PROGRESS and literally thousands of MS-DOS applications.

And, because of its interactive, real-time strengths, many users have developed their own BTOS applications to give them a real competitive edge. BTOS hardware can always keep you on-line, protecting your application environments.

Finally, BTOS modular technology lets you snap in added speed, memory and enhanced capabilities to satisfy the constantly changing needs of your business, while protecting your bottom line. No planned obsolescence here.

When the mission is essential, you need a system you can plug into. You need BTOS workstations. Call for more information: 1-800-547-8362.

UNISYS AND YOU
The power of²

iSYS

Green Giant

CONTINUED FROM PAGE 63

Haney said. The product is said to support both IBM 3270 terminal emulation for LAN-to-host connections and X.25 packet-switched links between LANs and hosts. The LAN-to-LAN connections will let users exchange electronic mail and access resources on remote LANs, Haney said.

The food firm has installed — for evaluation purposes — one SQL database server, a PS/2 Model 80 running Oracle, Inc.'s database management system, Haney said.

Pillsbury has also set up a fiber-optic link between the new LANs and workstations installed at scale houses, which weigh produce coming in from the field, Haney said. This eliminates the need to rekey weight tickets and other data into administrative systems, provides quicker reporting to production and makes the data immediately verifiable, he added.

PERHAPS THE MOST crucial component of the system, however, was the data entry package.

In addition, Pillsbury has some ideas that would provide direct links for sending production data from its Green Giant plants to the LANs and from there to corporate hosts via Datalex's data-entry system, according to Haney.

So far, the company has had four successful two-day transitions of user groups from the Honeywell system to the LAN system, with support from a two-person team, Haney said. He added that the mini-to-LAN conversion project is on schedule and under budget and should be completed by next March, if not before.

Pillsbury's acquisition by Grand Metropolitan PLC last January has actually accelerated the food manufacturer's trend toward a decentralized management style, because the parent company shares this philosophy, Haney said.

The Rockies Gibraltar But Your Data

3M diskettes, data cartridge tapes, computer tapes and rewritable optical disk cartridges. If you think some things in life are worth keeping-like the results of your hard work-we have a simple solution. Put your data on 3M media. It's rock solid.

© 3M 1989.

May Crumble, May Tumble, 's Here To Stay.*

For more information about 3M's full line of data storage products, phone 1-800-888-1889 ext. 15.

*©1938 CHAPPELL & CO. (Renewed) All Rights Reserved. Used by Permission.

3M

CO LAN

CONTINUED FROM PAGE 63

LANs against the slower speed alternative of linking computers via modems and dial-up or leased lines and have found that the higher CO LAN speeds (up to 56K bit/sec. in some regions) plus the flexibility of the switching make the CO LAN choice more attractive.

Industry analysts, however, predict that the CO LAN's viability will fizzle with the advent of ISDN Centrex, which provides users with two 64K bit/sec. lines to the desktop for integrated voice and data.

"The stake in the heart of CO LAN is ISDN," said Mike Kennedy, a consultant for Arthur D. Little, Inc.'s Information and Telecommunications Systems group in Cambridge, Mass. "ISDN does the job faster and, with the pricing I've seen, is — or will be — cheaper." And once local carriers provide ISDN connections to long-distance networks, the same ISDN link will connect a user to sites in the same area across the country or even overseas.

Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C., concurred: "CO LAN is just an intermediate solution until ISDN becomes fully deployed."

CO LANs should not be considered an alternative to private LANs, according to Thomas Nolle, president of CIMI Corp., a technology consulting firm in Haddonfield, N.J. "If users are in the same facility, a LAN is almost invariably a better choice because of performance," Nolle said. "The only instance where it might not be is when users are widely separated within a big building and don't have much need to communicate. Then, the LAN cabling might be too expensive."

Nolle said Centrex users are most economically suited to CO LANs. "The same cost justifications that would lead you to choose Centrex over a PBX [private branch exchange] for voice would lead you to choose CO LAN for data," he said.

A modem alternative

One South Central Bell Telephone Co. user does not fall under Nolle's categorization of Centrex users as prime CO LAN candidates. Coleman Research Corp. in Huntsville, Ala., has been awarded several contracts from the U.S. government. The company and two army sites — all needing to exchange data but not voice traffic — are located in an industrial park. Coleman maintains its own PBX for voice and shares data with the two army facilities via CO LAN.

"We're using the CO LAN strictly as a high-performance alternative to modems," said Bob Hawkins, a Coleman engineer. He explained that the modem speeds Coleman had been using — 2,400 bit/sec. — were unsatisfactory for certain applications, such as Ada software development, that require extensive editing sessions. Coleman is now transferring data to the army computers at 19.2K bit/sec. through the central office.

Hawkins noted that in his region, a CO LAN costs two to four times less than the leased-line/modem configuration. CO LAN also offered Coleman an improvement in security. Hawkins explained that since the data channel runs on top of the voice channel, "the regular hacker can't access our transmissions, because at that high frequency, you need special equipment to send and receive."

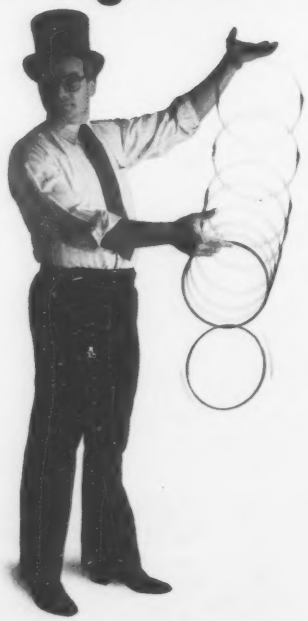
Another South Central Bell user, Huntsville City Schools, has opted to use a CO LAN to link IBM Personal Computer ATs, XTs and Personal System/2s in 42 schools to an IBM 4341 mainframe. The schools exchange attendance data, grades, schedules and electronic mail through the mainframe.

"We're basically linking 42 sites for the same price we had been paying to connect 13," said Bill Crowson, the school district's director of information systems.

Crowson had hooked five high schools and eight middle schools into the mainframe through a cluster controller using copper wire provided by South Central Bell, which he said was "very expensive."

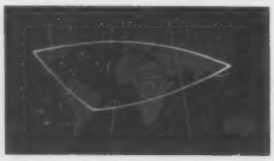
Before deciding on the CO LAN solution, Crowson evaluated fiber-optic and microwave alternatives. He said that at the time of his decision, he was not fully up to speed on ISDN technology, but will be evaluating the merits of ISDN Centrex during the next 12 months.

"Vitalink connected our token rings. Now our users think I'm a magician."



No smoke and mirrors. Vitalink's new TransRING bridges connect token ring networks to form a single, high-speed, wide area network.

Even when you want to run dozens of different applications and protocols, our TransRING lets you link all your sites over thousands of miles. Your users benefit from better connectivity and improved response times. They'll process more transactions, bring products to market faster, or simply get information sooner.



If you're ready to work magic with your network call Vitalink. The LAN Bridging Company. 800-443-5740 or 415-794-1100.

VITALINK
The LAN Bridging Company

BITBLAST

AMD to make DEC VLSI chips

Advanced Micro Devices, Inc. has agreed to manufacture and market **Digital Equipment Corp.**'s very large-scale integration chips, which incorporate the Fiber Distributed Data Interface (FDDI) standard. According to the vendors, the agreement should serve to accelerate the implementation of the FDDI standard on desktop devices as well as for other applications.

Cisco Systems, Inc. and **Ultra Network Technologies, Inc.** have entered an agreement to jointly develop high-performance interfaces between Cisco's AGS+ internetwork router and Ultra's 1G bit/sec. network, Ultranet. Cisco's AGS+ will provide Ultranet users with access to Ethernet local-area networks and to FDDI backbones that support speeds of 100M bit/sec., the vendors said. In addition, the interface will reportedly support both Open Systems Interconnect and Transmission Control Protocol/Internet Protocol.

We've made a name for ourselves in connectivity but you don't know it. Yet...

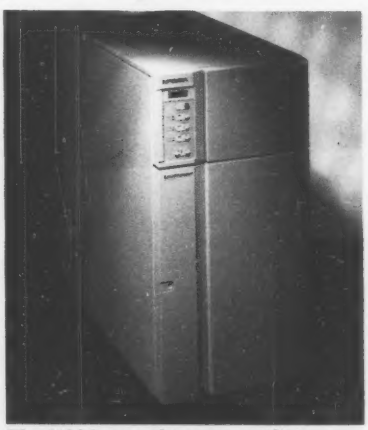
Though we have an installed base of more than 70,000 connectivity devices in more than 38 countries, a worldwide distribution and service system, and are the second-largest manufacturer of 3174 compatible cluster controllers, McDATA is not a familiar name in the industry. Until now, our controllers and other products have gone by many names, sold under private label to widely known vendors.

The 4174 11L supports 64 coax and 24 ASCII devices plus a token ring.

Now we are stepping forward. Twenty new LinkMaster® products, sold under our own name, will change the way the information networking industry thinks and acts about connectivity.

McDATA raises network communications to a new plane of efficiency, going beyond plug-compatibility to a sophistication in connectivity which represents a value in itself, not just a workaday necessity.

For example, for bulk file transfers between hosts, the LinkMaster 6100C network processor allows files on a host to be sent quickly and effectively to not just one, but multiple hosts in multiple locations.


The 6100C network processor utilizes existing channel connections for direct NetView interface.

MCD

Using the LinkMaster 5000 series of channel extenders, disaster recovery backup tapes can be made offsite whenever they are needed, eliminating the time and expense of manual tape transportation.

The 5000 series of channel extenders can be installed in less than one hour.

LinkMaster 4174 controllers interconnect 3270 terminals, ASCII terminals and PCs to multiple hosts, either DEC or IBM. And LinkMaster products enhance network management with direct NetView interface.

These are just a few highlight examples of McDATA's LinkMaster network solutions at work.

LinkMaster goes beyond compatibility to the next stage of the network communications evolution, a comprehensive multivendor connectivity which, in high-speed, long-distance channel communications, represents the next significant horizon to be crossed.

The new standard in managing large systems involves faster, more economical, more rational channeling of data across communications barriers which previously could not be spanned. McDATA is establishing that standard.

We span the gaps in network communications. **McDATA**

McDATA Corporation 310 Interlocken Parkway Broomfield, Colorado 80021 (303) 460-9200 **Boston/Chicago/Dallas/Atlanta/Los Angeles/San Francisco/Washington, DC/London/Munich**

DATA

Novell looks past departmental LANs

BY JOANIE M. WEXLER
CW STAFF

The company that made its fortune selling departmental local-area networks now sees itself as providing one component of a larger scheme within a user's information system.

In a series of recent announcements, Novell, Inc. embraced LAN-to-LAN internetworking with an upgrade of its Netware-to-VAX communications software and a repackaging of its disparate connectivity products into a cohesive product family.

Skip Addison, director of product planning for Novell's Communications Products Division, explained: "LANs are becoming part of the corporate information system strategy, and we have to support the WAN [wide-area network] world in order to make our LANs work for users."

Also during the announcement, the company rolled out an Ethernet Extended Industry Standard Architecture adapter, developed in conjunction with Compaq Computer Corp. Last month, the firm announced that it would offer Open Systems Interconnect-compliant products in 1990.

The company's Netware for VMS Version 2.1, scheduled to ship next week, puts the software on par with Netware Version 2.12 functionality and also supports Decnet routing, which reportedly allows routing between two remote Digital Equipment Corp. VAX minicomputers on Netware LANs or two remote Netware LANs to be connected via Decnet and Netware for VMS.

"Novell has been able to capture a large part of the VAX market because they're the only ones who have written a product that actually runs on the VAX," said Katherine Barrett, a manager in the network consulting practice at Ernst & Young in New York.

"Banyan and 3Com both offer access to the VAX, but you're always acting as a terminal, and the files on the VMS are always VAX files. With Netware for VMS, you can access those files as a PC, and Novell's software will translate the files back and forth between DOS and VMS."

Scott Wells, Novell's Netware for VMS product manager, said that the updated software also offers a 40% improvement in sequential writes, which users had been requesting.

Memory requirement reduced

He added that the memory that is required to support Netware's terminal emulation services, which provide an underlying connection across Ethernet, Arcnet and other topologies, has been reduced from 48K bytes to 32K bytes and that the service is accessible from the DOS command line.

Novell's Netware Link product family, which represents a reorganization and rearchitecting of the company's internetworking products, includes enhancements and upgrades to the Netware Asynchronous Remote Bridge, Netware X.25 Point-to-Point and Multi-Point Bridges and Netware T1 Bridge.

Addison said the company has added more network management features and support for high-speed dial-up modems. In addition, he said, the X.25 offering now supports a remote console capability, as well as a 10 packet/sec. increase in performance.

The Netware T1 Bridge, announced last spring, now reportedly supports a two-port adapter board and is scheduled to ship next month.

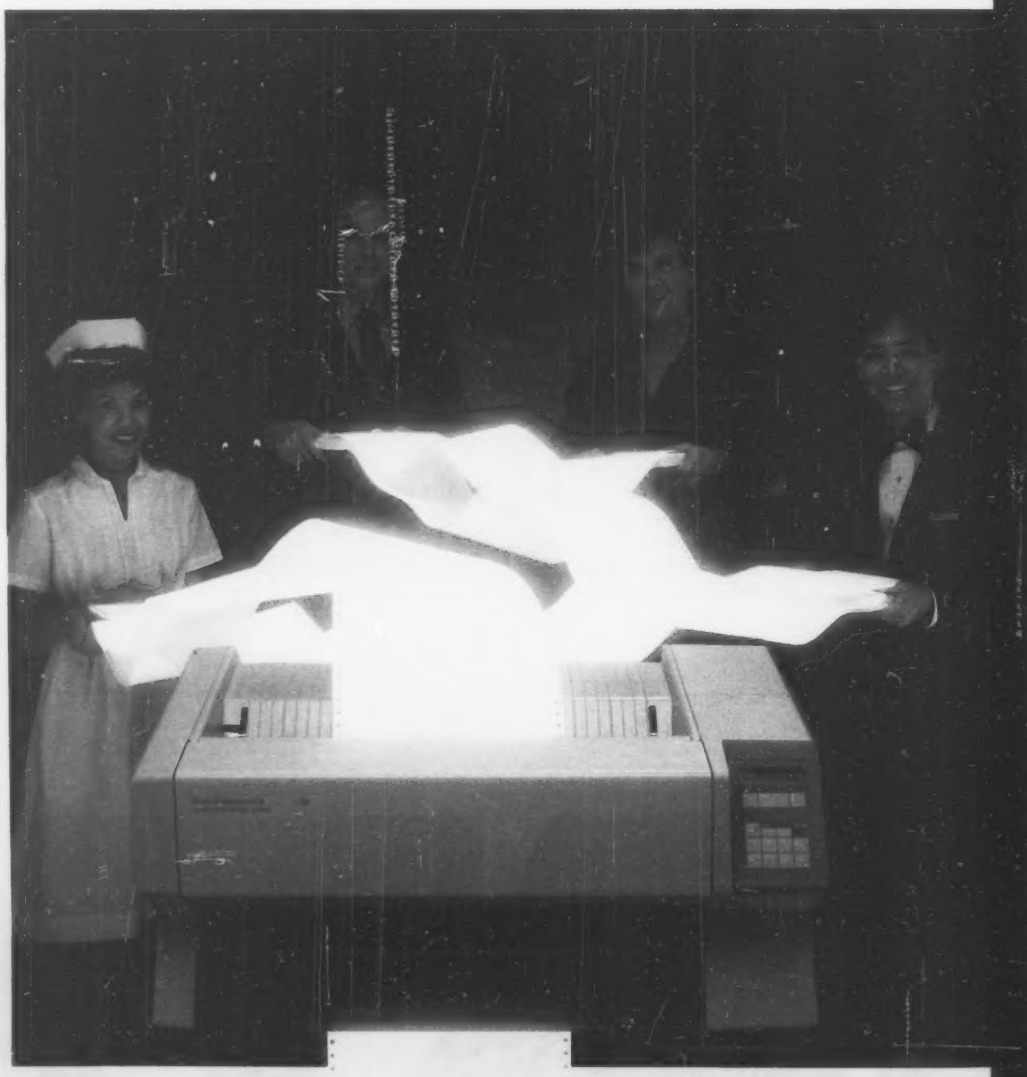
Unveiled at Autofact '89

Some of the tools and new products announced at the Autofact '89 show late last month included the following:

- Control Data Corp. support for Sun Microsystems, Inc., Apollo Computer and Silicon Graphics workstations in the latest release of EDL, its manufacturing information system. CDC promised that the product, which previously supported only Cyber workstations, servers and mainframes, would get a graphical user interface by mid-1990.
- IBM and Unisys Corp. announced marketing agreements with relational database vendors to move data between applications programs and shop-floor equipment. Intercim Corp. will license its product to Unisys customers for use on Unisys U series Unix-based minicomputers. In addition, Unisys announced a faster version of its Geometric Modeling Software (GMS) to the Sun Microsystems, Inc. Sparcstation in conjunction with images from the Unisys Info Image Engineering Document Management System (EDMS).
- Statistical data analysis software vendor SPSS, Inc., in Chicago, threw its hat into the computer-integrated management market with Process Manager, a new statistical process control system. The product is for IBM Personal Computers and compatibles and is slated to be available early next year, according to the company.

A unique cost-saving solution – only from Texas Instruments.

Many users. Multiple



NEW AT COMDEX/FALL '89

The following products and services were announced at the Comdex/Fall '89 show:

• Gateway Communications, Inc. in Irvine, Calif., a supplier of X.25 wide-area networking products, introduced the G/X25 Gateway 64. The combination hardware and software product was designed to give local-area network users access to remote minicomputers and mainframes through high-speed digital data or T1 circuits at speeds up to 64K bit/sec. An on-board Intel Corp. 80186 CPU chip and special firmware are provided for multitask protocol processing, the company said. The gateway is said to be compatible with Novell, Inc.'s Netware and OS/2 LAN Manager via Netbios. It includes 27 different terminal emulators.

Capable of supporting as many as 254 virtual circuits, the gateway can be installed in any IBM Personal Computer, XT, AT, Personal System/2 Model 30 or compatible system, or in Intel 80386 Industry Standard Architecture and 80486 Extended Industry Standard Architecture (EISA) bus machines. It is priced at $3,445.

• Interphase Corp. in Dallas unveiled a small computer systems interface (SCSI) host bus adapter created specifically for computers based on the EISA bus. According to the company, the E/SCSI 4810 Barracuda is a single- or dual-channel SCSI host bus adapter. Each SCSI bus reportedly can handle as many as seven SCSI devices for a total of 14 peripheral units, including magnetic or optical-disc drives, tape transports and printers. The product transfers data over the 32-bit EISA bus using Type C direct-memory access burst mode at 33M byte/sec. It sells for $2,490. The 4810 Barracuda is scheduled for delivery in January 1990.

• Unison Technologies, Inc. in Mission Viejo, Calif., announced three on-line, sine wave uninterruptible power supply (UPS) products for the Novell, Inc. Netware LAN environment. The Unipower MPS800, MPS1200 and MPS1500 provide 800, 1,200 and 1,500 VA, respectively, the company said. The units also provide an RS-232 interface and UPS monitoring software. Pricing ranges from $1,099 to $2,199.

• Torrance, Calif.-based Kansai International, Inc. introduced a line of printer-sharing products. The DSS family reportedly allows multiple personal computer users to access multiple peripherals without needing the use of memory-resident software. According to the vendor, the products can handle data automatically, but the user also may utilize a mouse-like remote-control unit for switching controller and status indicators for the system. Switching can also be controlled via text command. Retail pricing ranges from $299 to $359.

• Universal Data Systems in Huntsville, Ala., announced a 9.6K bit/sec. V.32 modem that complies with the CCITT's V.42 error-correction standard. Dubbed the Fastalk V.32/42, the device supports full-duplex data transmission at 9.6K bit/sec. and is AT command set-compatible, the company said. Pricing has been set at $1,045 for single-unit quantities.

forms. One printer.

Offer your customers the new 8900 Series from Texas Instruments. Shared printers that print forms and more. For heavy-duty users — whatever their needs.

Now you can offer your customers a cost-saving, shared printer solution: one printer that serves a variety of users, prints a variety of forms and other documents, in a variety of business environments.

Lots of forms. Lots of speed. Lots of value.

The 8900 Series can print six- to nine-part forms at up to 400 characters per second, data processing applications at up to 600 cps, or correspondence at 100 cps in the letter quality mode. That kind of flexibility – not offered by many other printer manufacturers – makes the 8900 Series a natural for applications of all types.

What's more, these printers offer rugged reliability. Meantime between electronics failures is 9,000 hours with no duty cycle limitations. The 8900 Series can even replace some low-end line printers with its 16,000 pages* a month output capability.

Intelligent printing means easy printing.

What also sets 8900 series printers apart is their combination of intelligent forms handling with flexible printing and paper handling capabilities. For example, TI's special Z-Axis Control™ automatically senses a document's thickness and adjusts the printhead to its optimal position.

The Page Finder™ feature helps eliminate misaligned paper by automatically sensing the right and left margins, regardless of where the tractors are set or where the document is inserted. Plus, 8900 Series printers can automatically sense the top of forms to achieve zero tear-off. As a result, users don't have to worry about making adjustments themselves.

The 8900 Series also features a user-friendly control panel with a liquid crystal display. Users can select options like print quality, font styles, menu status and others with the touch of a Powerkey™ button.

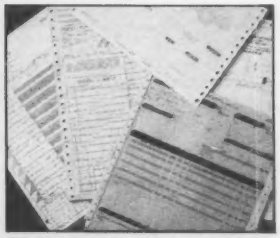
More features in one product.

An 18-pin printhead ensures crisp, readable text, even on the last copy of up to nine-part forms. With five print speeds, the printers can handle high-speed reports as well as letter-quality correspondence.

Seven-color printing is also available. Some models offer a paper parking feature that enables users to feed a single form or other cut-sheet paper without having to disconnect the tractor feed. And you can deliver extra value by customizing the printers to meet your customers' unique needs.

The shared printer solution is a call away.

Find out today how you can become a TI reseller. Call 1-800-527-3500.



TI's 8900 Series prints a variety of forms for a variety of users.

TEXAS INSTRUMENTS

For single-user printing, offer TI's new 83X Series.

TI also provides you with a workstation printer solution. The Model 830 and 835 printers combine such personal printer features as an easy-to-use control panel and key forms printing features like short tear-off and a straight paper path.

The Model 830 is a narrow carriage printer while the 835 has a wide carriage. Both printers feature such versatile paper handling characteristics as bottom, rear and top feed; automatic cut-sheet insertion; paper parking; and up to five-part forms printing.

You can also offer options like a user-installable serial interface board; a sheet feeder; and a pull tractor (required for bottom-feed paper handling).

Users can choose from three print speeds, including high-speed draft mode (300 cps), utility mode (250 cps) and near-letter quality mode (63 cps). Whether your customers need the multi-user 8900 Series or the single-user 83X Series, TI lets you offer the printers they need when their needs are demanding.

© 1989 TI 44365
*Based upon 2,000 characters per page.
Z-Axis Control, Page Finder and Powerkey are trademarks Texas Instruments Incorporated.

NEW AT DEXPO EAST '89

The following products and services were announced at the Dexpo East '89 show:

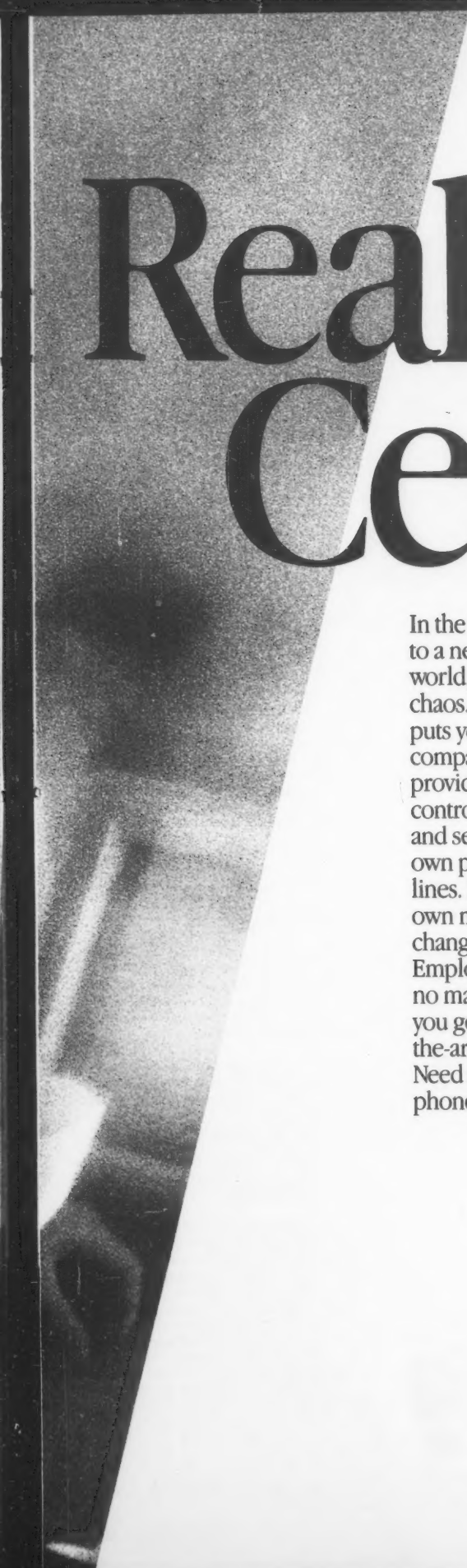
• San Diego-based Talaris Systems, Inc. demonstrated two printers with an Ethernet-capable replacement option for the Digital Equipment Corp. LNO3 Plus printer. The Optional Ethernet capability is a feature designed for the company's 50 page/min. 5093 ion-deposition printer and 1590-LN 15 page/min. multiuser laser printer with enhanced DEC LNO3 emulation. The 5093 costs $29,995, and the 1590-LN costs $6,490. The Ethernet option is available for $1,950.

• A tester for use in local-area network certification was introduced by Beckman Industrial Corp. in La Habra, Calif. The TMT-1 Transmission Medium Tester reportedly measures 9.5 by 6.3 by 2 in. and weighs in at under five pounds. It performs a series of electrical tests in automatic sequence or individually under operator control, the company said. Retail list price is $3,200, and a two-year limited warranty is included.

• Niravoice, Inc., based in San Jose, Calif., announced a product to provide repeater-interconnection between Standard Ethernet (10Base5) coaxial segments and Thin Ethernet (10Base2) coaxial segments. The NC-208 includes two AUI ports and eight BNC-type ports and offers collision detection, jam generation, collision fragment extension and automatic segment isolation capabilities. It lists at $2,495.

• Fel Computing in Williamsville, Vt., introduced a new member of its Mobius product line targeted especially at end users. Personal Mobius reportedly offers DEC VT220/320-compatible terminal emulation, file transfer, a virtual file system, printer support and automatic installation capabilities. The program allows users to receive DEC VAX broadcast messages on their personal computers, the vendor said, and gives them the ability to create keyboard macros. It is priced at $525 for a single-user system and includes software for both the PC and the DEC VAX, documentation and 90 days of software support. Quantity discounts are available.

© 1989 AT&T



Real-World Centrex.

In the tidy world of diagrams, nobody ever moves to a new office. Or changes jobs. But in the real world, moves and changes create telephone chaos. Where can you find a phone system that puts you back in control? At your local phone company. With advanced Digital Centrex Service provided from the Central Office, you get to control, assign and service your own phone lines. Make your own moves and changes. Right from your own premises. Employees get to keep the same phone number no matter where or how often they move. And you get to keep your sanity. All thanks to the state-of-the-art 5ESS® Switch from AT&T Network Systems. Need a change? Make a move. Call your local phone company.

You and Your Local Phone Companies

AT&T Network Systems

C.Itoh Electronics, Inc. has introduced the CIT-X monochrome Network Display Station for the Digital Equipment Corp. Decwindows and X Windows System environments.

The 15-in. unit incorporates dual processing capability and can function as a network terminal when not being used in an X Window environment. It supports Ethernet hardware and Transmission Control Protocol/Internet Protocol and includes 512K bytes to 1M byte of read-only memory.

The display station is priced at $2,795, the firm said.

C.Itoh
2505 McCabe Way
Irvine, Calif. 92714
800-347-2484

The ACS 4800 *condenses multivendor network monitoring into a single point*

Network management

Advanced Computer Communications has introduced the ACS 4800, a Simple Network Management Protocol-based network management system. According to the company, the product extends its line of ACS Series 4000 local-area network connection products and provides network managers with tools for planning, configuring and troubleshooting multivendor networks from a single point. The system indicates changes in network status by flashing an alarm clock icon or sounding an optional beep.

It is available with a Sun Microsystems, Inc. Sun-4/Sparcstation as a complete turnkey system for $27,420 or as a separate software package for $9,500, the firm said.

Advanced Computer
720 Santa Barbara St.
Santa Barbara, Calif. 93101
805-963-9431

Castle Rock Computing, Inc. has introduced a network management product based on the Simple Network Management Protocol.

Developed for use on IBM Personal Computer ATs and compatible platforms, SNMPC is capable of managing bridges and routers from a variety of different vendors, the company said. It is available for the Microsoft Corp. Windows environment and does not require a dedicated management station. The product is priced at $995.

Castle Rock Computing
Suite 118
2841 Junction Ave.
San Jose, Calif. 95134
408-434-6608

Links

A 10BaseT-compliant twisted-pair Ethernet product was announced as part of Fibermux Corp.'s recently introduced family of Crossbow networking hub systems.

The initial FX6600 Crossbow product line reportedly includes a multimedia hub, interface modules that support 10BaseT on unshielded twisted-pair, 10BaseT on shielded twisted-pair, and fiber-optic cable. The Crossbow system was designed to provide higher capacity, redundancy and network management requirements for complex networks, the vendor said. Using 10BaseT, Crossbow supports as many as 110 workstations connected to a single hub, and multiple hubs may be interconnected with fiber-optic cable, twisted-pair or coaxial cable to support thousands of workstations on the same network.

Pricing for a fully equipped FX6600 chassis with redundant power supplies and 10BaseT interfaces starts at $4,365. Fiber-optic system pricing starts at $4,040.

Fibermux
9310 Topanga Canyon Blvd.
Chatsworth, Calif. 91311
818-709-6000

Concept Communications, Inc. has announced the Teletraveler, a full-motion interactive audio/video conference system that reportedly transmits over digital service at user-selected bandwidths of 384K bit/sec. and 768K bit/sec.

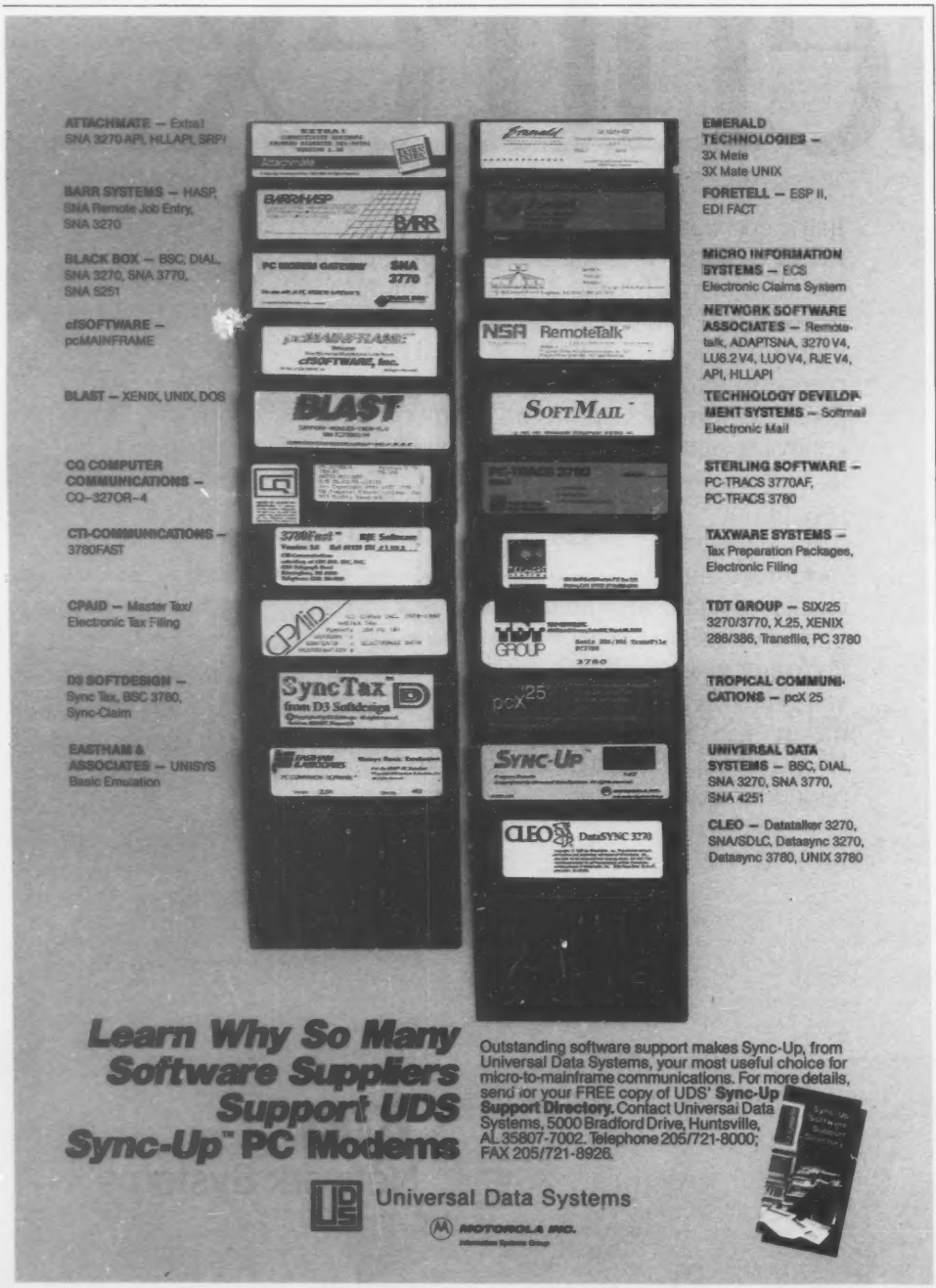
The unit is housed in a single cabinet that incorporates an enhanced video processor and a toll-quality audio processor, according to the vendor. The product is priced at $5,995.

Concept Communications
Suite 4038
1950 Stemmons
Dallas, Texas 75207
214-746-3888

Aeon Systems, Inc. has introduced its Viva family of intelligent bus-to-bus links for Q-Bus, VAXBI, Motorola, Inc. VMEbus and Multibus II systems.

The product line is targeted toward systems designers and integrators and reportedly allows them to create distributed solutions to real-time acquisition, control and simulation problems. The links reportedly incorporate a bus interface controlled by a local processor and a piggybacked link personality module. Prices range from $10,000 to $25,000, depending on backplane interfaces.

Aeon Systems
P.O. Box 10300
Albuquerque, N.M. 87184
505-828-9120


ATTACHMATE — Extra!
SNA 3270 API, HLLAPI, SRPI
BARR SYSTEMS — HASP, SNA Remote Job Entry, SNA 3270
BLACK BOX — BSC, DIAL, SNA 3270, SNA 3770, SNA 5251
cfSOFTWARE — pcMAINFRAME
BLAST — XENIX, UNIX, DOS
CQ COMPUTER COMMUNICATIONS — CQ-3270R-4
CTI-COMMUNICATIONS — 3780FAST
CPAID — Master Tax/ Electronic Tax Filing
D3 SOFTDESIGN — Sync Tax, BSC 3780, Sync-Claim
EASTHAM & ASSOCIATES — UNISYS Basic Emulation
EMERALD TECHNOLOGIES — 3X Mate 3X Mate UNIX
FORETELL — ESP II, EDI FACT
MICRO INFORMATION SYSTEMS — ECS Electronic Claims System
NETWORK SOFTWARE ASSOCIATES — Remotetalk, ADAPTSNA, 3270 V4, LU6.2 V4, LUO V4, RJE V4, API, HLLAPI
TECHNOLOGY DEVELOPMENT SYSTEMS — Softmail Electronic Mail
STERLING SOFTWARE — PC-TRACS 3770AF, PC-TRACS 3780
TAXWARE SYSTEMS — Tax Preparation Packages, Electronic Filing
TDT GROUP — SIX/25 3270/3770, X.25, XENIX 286/386, Transfile, PC 3780
TROPICAL COMMUNICATIONS — pcX 25
UNIVERSAL DATA SYSTEMS — BSC, DIAL, SNA 3270, SNA 3770, SNA 4251
CLEO — Datatalker 3270, SNA/SDLC, Datasync 3270, Datasync 3780, UNIX 3780
Learn Why So Many Software Suppliers Support UDS Sync-Up™ PC Modems
Outstanding software support makes Sync-Up, from Universal Data Systems, your most useful choice for micro-to-mainframe communications. For more details, send for your FREE copy of UDS' Sync-Up Support Directory. Contact Universal Data Systems, 5000 Bradford Drive, Huntsville, AL 35807-7002. Telephone 205/721-8000; FAX 205/721-8926.
Universal Data Systems
MOTOROLA INC.

EXECUTIVE TRACK

Joe K. Clema has been appointed technical director of the **Science Applications International Co. (SAIC)** information systems group in McLean, Va.

Clema will assist IS managers with current projects and business development efforts, serve as the contact for the IS group with other SAIC organizations and provide systems engineering support to IS program development. Clema holds a Ph.D. in engineering from Colorado State University.

Clema is a former chairman of the Association for Computing Machinery special interest group for simulation and a senior member of the Institute of Electrical and Electronics Engineers.

.....

Ralph G. Harris has been appointed telecommunications and operations manager at the Chicago recovery center of **Sungard Data Services, Inc.**

A 23-year IS veteran, Harris was most recently capacity planning and data communications manager at Navistar International Corp. in Chicago. Before that, he was national network manager at Montgomery Ward, Inc. in Chicago.

Sungard Data Services also appointed **Robert R. Winkler** as executive director of the Midwest region, with responsibility for the Chicago center. Winkler was formerly regional consulting engineer at Intecom, Inc. and telecommunications manager at Packaging Corporation of America.

.....

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Scripting Hollywood success with IS

MCA's Brenner directs cast of hundreds to attain clearly set goal: enhanced earnings

When the nation's top entertainers adorn the cover of Forbes ***and earn more than the nation's top executives, it is clear that the arts and film industry has reached the top echelons of U.S. business in the late 1980s. As that has happened, the entertainment business has become much more dependent on the strategic use of information. This week and next,*** Computerworld ***profiles the top IS executives making things happen at two entertainment giants: George Brenner at MCA, Inc. in Hollywood and Don Winski at Warner Communications, Inc. in New York.***

BY JAMES DALY
CW STAFF

If you catch *Back to the Future II* in the next few months, take a moment to reflect while you are popping Jujubes and slurping down an Orange Whip. While Michael J. Fox may have the thespian skill and Steven Spielberg the production panache to make the film a success, if it were not for the efforts of George Brenner, you might be home playing canasta.

Although others may sport the Oscars, the information systems management skill of Brenner is as integral to a movie's success as any crackerjack Hollywood publicist. As vice-president of corporate information services at $3.5 billion MCA, Inc., the parent company of Universal Pictures, Brenner steers the IS direction of one of the world's largest entertainment complexes.

In the spirit of the industry, Brenner runs his shop with the command-post efficiency of a veteran film director. He plops a six-month managerial plan on his tidy desk, its bulk resembling the script of some forthcoming blockbuster. A list of strategic goals, as tight and demanding as any shooting schedule, is nearby. And Brenner makes it quite clear that the package must come together on time and under budget.

"Speaking bluntly, my job here is to enhance earnings per share," Brenner says. "But I'm not a revenue center. The only way I can do that is to make sure the gathering, processing and distributing of information is timely and gives us a competitive edge."

In an organization as large as MCA, whose products range from clothing and compact discs to toys, the job of effectively integrating the diverse pieces of the company is akin to juggling hoops. The stylish 44-year-old Brenner succeeds at that task by articulating IS in business terms, says his boss, MCA Chief Financial Officer Harold Hass.

"He has a great ability to discuss the mysteries of electronic data processing with company executives so that they can understand and respond to it," Hass says. "As a result, we've

Continued on page 82

PROFILE: George Brenner

ALAN LEVENSON

Position: *Vice-president of corporate information services, MCA, Inc.*
Mission: *Directing timely information processing and distribution for a competitive edge*

CIOs not wedded to current positions

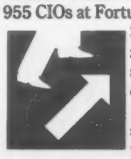
BY ALAN J. RYAN
CW STAFF

The general consensus of a recent study of chief information executives seems to be, "Sure, I'm married, but not to my job."

According to the survey of approximately 300 top information executives, 35% — or more than 100 of them — expect to change positions within the next two years.

One-third of those who indicated they would change jobs said they feel they have accomplished as much as they can at their present organizations, and an additional 21% said they are not happy with the information systems structure or policy where they work. Fourteen percent said they will change jobs through promotions within that time frame.

The chief information officer study, conducted by executive search firm Heidrick and Struggles, was mailed to 955 CIOs at Fortune 500 and Fortune Service 500 organizations, and 300 responses were received.



Half of those who said they were likely to change jobs within two years said they work for companies with annual revenue of less than $1 billion.

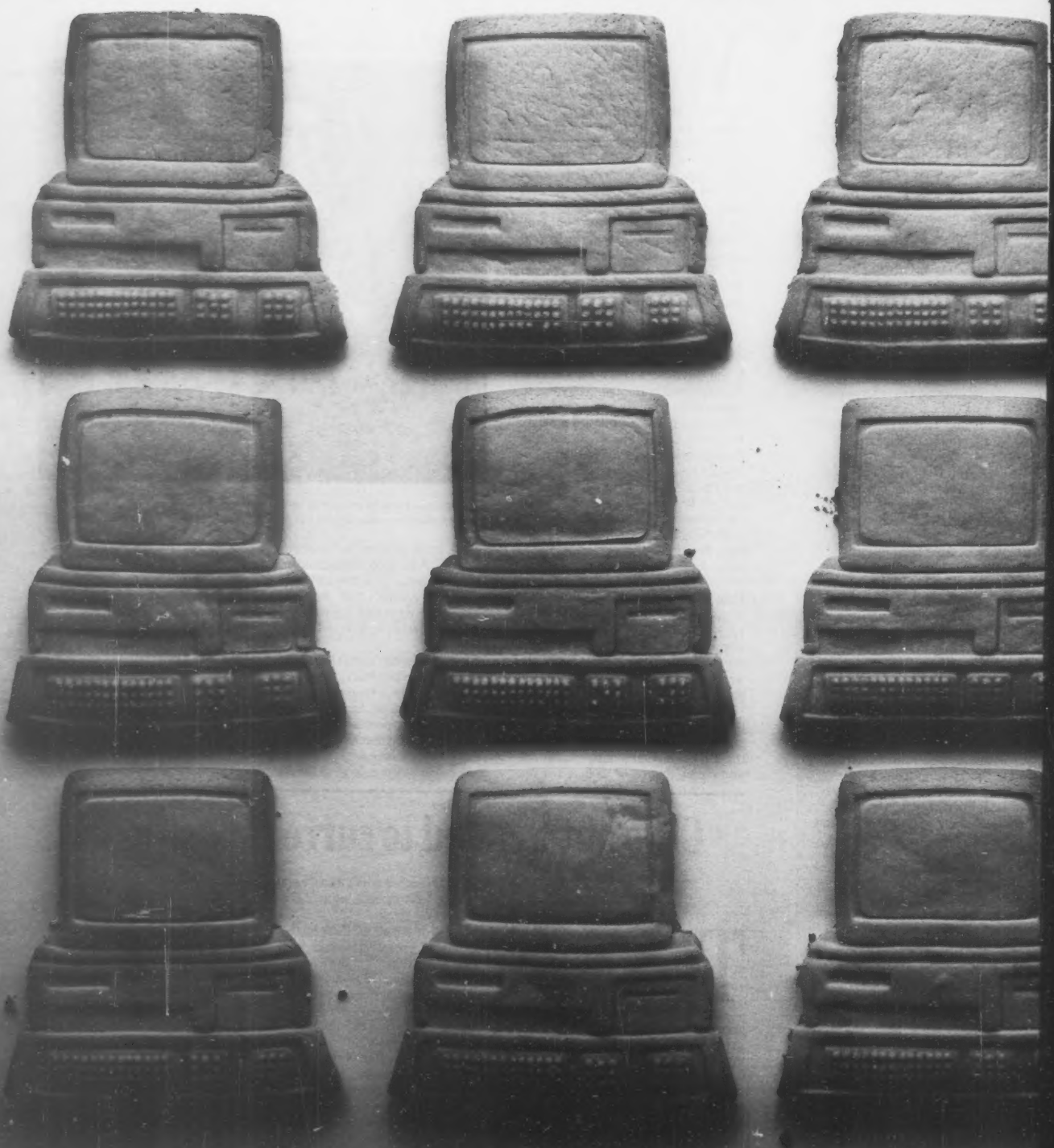
Five out of seven respondents rated their job security as very high or high. Additionally, three out of 10 said their firms are planning to decentralize IS, but of those information chiefs whose companies will decentralize, only 9% said such an action would pose a threat to their job security.

The personal lives of the respondents seemed more stable than their careers. Of the total number of respondents, three-fourths said they are still married to their first spouse.

Seventy-five percent also said they have sufficient time to spend with their families, and slightly more than half said they feel they have enough time to pursue their outside interests.

Although the average amount of vacation time allotted to the respondents was four weeks, seven out of 10 said they only used three weeks or less of their vacation time.

FOR $1899, YOU CAN GET OF COMPUTERS.



SAVE NOW ON THE DELL SYSTEM® 325 25 MHz 386.™

AN EVEN BETTER VALUE AT THESE LOW PRICES.

STANDARD FEATURES:

- Intel 80386 microprocessor running at 25 MHz.
- Choice of 1 MB, 2 MB or 4 MB of RAM* expandable to 16 MB (using a dedicated high-speed 32-bit memory slot).
- Advanced Intel 82385 Cache Memory Controller with 32 KB of high speed static RAM cache.
- Page mode interleaved memory architecture.
- VGA systems include a high performance 16-bit video adapter.
- Socket for 25 MHz Intel 80387 or 25 MHz WEITEK 3167 math coprocessor.
- 5.25" 1.2 MB or 3.5" 1.44 MB diskette drive.
- Dual diskette and hard drive controller.
- Enhanced 101-key keyboard.
- 1 parallel and 2 serial ports.
- 200-watt power supply.
- 8 industry standard expansion slots (6 available).

Commercial Lease Plan. Lease for as low as $153/month.

△***Extended Service Plan pricing starts at $370.***

40 MB VGA Monochrome System	$4,199
100 MB VGA Color Plus System	$5,099
100 MB Super VGA Color System (800 x 600)	$5,199
150 MB Super VGA Color System (800 x 600)	$5,699

Prices listed reflect 1 MB of RAM. 322 MB hard drive configurations also available.

THE NEW DELL SYSTEM® 316LT

This new full-featured, battery powered 386SX laptop costs less than most 286 laptops.

STANDARD FEATURES:

- Intel 80386SX microprocessor running at 16 MHz.
- Choice of 1 MB or 2 MB* of RAM expandable to 8 MB (on the system board using 1 MB SIMMs).
- LIM 4.0 support for memory over 1 MB.
- Adjustable and detachable 640 x 480 VGA Liquid Crystal Display.
- One industry standard half-size 8-bit expansion slot.
- Socket for 16 MHz Intel 80387SX math coprocessor.
- 3.5" 1.44 MB diskette drive.
- 83-key keyboard with embedded numeric keypad and 12 function keys.
- 1 parallel, 1 serial, and external VGA monitor port.
- Connector for 101-key keyboard or numeric keypad.
- Removable and rechargeable NiCad battery pack utilizing Dell's "continuous power" battery system (patent pending).
- AC Adapter.

Commercial Lease Plan. Lease for as low as $127/month.

△***Extended Service Plan pricing starts at $295.***

20 MB, 1 MB RAM	$3,499
20 MB, 2 MB RAM	$3,699
40 MB, 1 MB RAM	$3,799
40 MB, 2 MB RAM	$3,999

For a limited time, get a free battery pack with your purchase.

*Performance Enhancements: Within the first megabyte of memory, 128 KB (316SX, 316LT and 210), 384 KB (325) of memory is reserved for use by the system to enhance performance. Can be optionally disabled on 316SX and 210. 4MB configurations available on all systems. Call for pricing. All systems are photographed with optional extras. All prices and specifications are subject to change without notice. Dell cannot be responsible for errors in typography or photography. **Payments based on a 36-month, open-end lease. Leasing arranged by Leasing Group, Inc. In Canada, configurations and prices will vary.

TELL US WHAT TO DO NEXT.

For your free Dell product catalog, write us. Or call 800-426-5150. In Canada, call 800-387-5752.

☐ Please have a Dell representative call me.

Name: (M) _____
Please Print

Title: _____

Company: _____

Address: _____

City: _____ State: _____ Zip: _____

Type of Business: _____

Approx. # of Employees in Company: _____

Home Phone: ( ) _____

Business Phone: ( ) _____

1. Which products are you most interested in?
   A ☐ 286-based systems
   B ☐ 386™-based systems
   C ☐ 386SX-based systems
   D ☐ UNIX-based systems
   E ☐ Laptops
   F ☐ Other
2. Are you interested in computer products for:
   A ☐ Home B ☐ Business
3. How many PCs do you (your company) plan to purchase in the next twelve months?

Timeframe	Quantity
A ☐ Less than 1 month	
B ☐ 1-3 months	
C ☐ 3-6 months	
D ☐ 6-12 months	
E ☐ More than 12 months	

4. How many PCs do you have installed now? _____
5. Are you a (select one):
   A ☐ End user
   B ☐ Consultant
   C ☐ Reseller
   D ☐ Corporate Purchaser
   E ☐ DP/MIS Purchaser
   F ☐ Government Purchaser
   G ☐ Other: _____

AD CODE 51H13

THE NEW DELL SYSTEM® 316SX 16 MHz 386SX.

The perfect low profile mainstream computer, combining 386SX power and compatibility with unprecedented value and support.

STANDARD FEATURES:

- Intel 80386SX microprocessor running at 16 MHz.
- Choice of 512 KB, 640 KB, 1 MB or 2 MB* of RAM expandable to 16 MB (8 MB on the system board).
- Page mode interleaved memory architecture.
- LIM 4.0 support for memory over 640 KB.
- Integrated diskette and high performance 16 bit VGA video controller on system board.
- Socket for Intel 80387SX math coprocessor.
- 5.25" 1.2 MB or 3.5" 1.44 MB diskette drive.
- Integrated high performance hard disk interface on system board.
- Enhanced 101-key keyboard.
- 1 parallel and 2 serial ports.
- 3 full-sized 16-bit AT expansion slots available.

Commercial Lease Plan. Lease for as low as $72/month.

†***Extended Service Plan pricing starts at $187.***

20 MB VGA Monochrome System	$1,899
40 MB VGA Color Plus System	$2,399
40 MB Super VGA System (800 x 600)	$2,499
100 MB Super VGA System (800 x 600)	$3,099

Prices reflect 512 KB of RAM. 640 KB versions of the above systems are available for an additonal $50, 1 MB versions for an additional $150, and 2 MB versions for an additional $300.

THE DELL SYSTEM® 210 12.5 MHz 286.

The price says it's an entry-level system. The performance says it's a lot more.

STANDARD FEATURES:

- 80286 microprocessor running at 12.5 MHz.
- Choice of 512 KB, 640 KB, 1 MB or 2 MB* of RAM expandable to 16 MB (6 MB on the system board).
- Page mode interleaved memory architecture.
- LIM 4.0 support for memory over 640 KB.
- Integrated diskette and high performance 16-bit VGA video controller on system board.
- Socket for Intel 80287 math coprocessor.
- 5.25" 1.2 MB or 3.5" 1.44 MB diskette drive.
- Integrated high performance hard disk interface on system board.
- Enhanced 101-key keyboard.
- 1 parallel and 2 serial ports.
- 3 full-sized 16-bit AT expansion slots available.

Commercial Lease Plan. Lease for as low as $61/month.

†***Extended Service Plan pricing starts at $158.***

20 MB VGA Monochrome System	$1,599
20 MB VGA Color Plus System	$1,899
40 MB VGA Monochrome System	$1,799
40 MB VGA Color Plus System	$2,099

Prices listed reflect 512 KB of RAM. 640 KB versions of the above systems are available for an additional $50, 1 MB versions for an additional $150, and 2 MB versions for an additional $300.

100 MB hard drive configurations also available.

DELL SYSTEM is a registered trademark of Dell Computer Corporation. 386 is a trademark and Intel is a registered trademark of Intel Corporation. Other trademarks and trade names are used in this advertisement to refer to products and software marketed by the entities claiming the marks and names. Dell Computer Corporation disclaims any proprietary interest in trademarks and trade names other than its own.
*Service provided by Xerox Corporation. On-site service may not be available in certain locations. ©1989 Dell Computer Corporation. All rights reserved.

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 6745 AUSTIN, TEXAS

POSTAGE WILL BE PAID BY ADDRESSEE

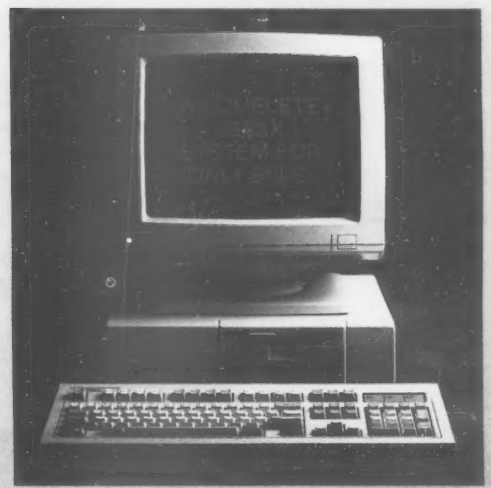
DELL COMPUTER CORPORATION
Dept. DH
9505 Arboretum Boulevard
Austin, Texas 78759-9969

A LOT

OR A LOT OF COMPUTER.

OK. So you don't have the biggest budget in the world. But that doesn't mean you have to think small.

Introducing the Dell System® 316SX, 16 MHz 386™SX.



Now you can get into 32-bit computing with this complete 20 MB system. Including 512 KB of RAM, a VGA Monochrome monitor, and three 16-bit industry standard expansion slots. With a 5¼" or a 3½" diskette drive.

More important, it's built by Dell. The computer company rated number one for overall customer satisfaction in the last four *PC Week* polls of corporate volume buyers.

Over IBM. Over Compaq.

And every Dell System comes with a one-year warranty, toll-free technical support and next-day desk-side service provided by the Xerox Corporation.* So for $1899, you don't have to buy a cookie cutter clone and go it alone.

Call Dell. You'll get a lot of computer. With a lot of company.

800-426-5150

*Under all but Dell's 6 month, 800-BY-DELL

DELL COMPUTER CORPORATION

TAKING CHARGE

Alan J. Ryan

Check out your junk mail

How I wound up on the mailing list is beyond me. Perhaps it was through my brief encounter with a record club 10 years ago when I was naive enough to believe that 13 albums for 1 cent (if I agreed to order 10 more at regular club prices during the next year) was a good deal. I always blame the record club when I return home at the end of the day to find my mailbox overflowing with junk mail.

Lately, however, my mailbox has been bombarded with information for chief executive officers and what I (Mr. Ryan or current resident) should know about being a CEO. The literature is interesting — it hardly fits the "junk" category. Much of it deals with seminars that CEOs should attend or magazines they should buy, and a great deal of it talks about information systems.

Sure, readers of *Computerworld* agree that the successful companies are those whose senior managers can see the need for IS, understand the benefits derived from it and are willing to champion the IS department through the budgeting cycle. We may be just a tad prejudiced in this respect, but we are correct.

We all read stories about chief information officers who work closely with their CEOs. Some even hit the fairways together on weekends. They meet to share technology and business information, and the CEO might even know what ISDN stands for.

But what we usually do not hear about are the companies whose IS directors and their systems are an unknown quantity to the CEOs.

Welcome to my mailbox! More and more universities are beginning to offer short-term courses, such as "The benefits of IS for the nontechnical manager," or "Achieving competitive advantage through the effective use of computer systems."

The classes tend to provide an overview of computer systems and examples of how companies have used them to become market leaders. They do not need to get down into the nitty-gritty bits and bytes of computerese, so they don't.

That is the kind of education that you, as IS professionals, need to be providing and encouraging within your companies. If your top executives are not as savvy as some that you have read about in these pages, you may consider holding in-house classes run by you and/or members of your department. You can bring in outside sources, including professors from local universities or executives from other companies in your area.

If your organization is not large enough to make an internal program possible, contact the top business schools in your area to see what types of programs are offered to help educate your top executives about technology.

One thing is sure: The CEO at my former record club is interested in technology. I know this because of a simple observation I've made of my mailbox.

I canceled my membership nine years ago, but the record club has yet to drop my name from its mailing list. I've changed addresses six times since belonging to the club, yet I still get junk mail from them, which proclaims boldly on the envelope, "Our search is over. We've found you! Look inside for membership information."

So, if all other attempts to educate your chief executive officer on technology fail, maybe, just maybe, you may consider filling out a record club membership in his name.

Ryan is a *Computerworld* senior writer.

The Racal-Quanta Fiber Product Guarantee

Our free one-year service contract backs our promise of flawless fiber product performance.

Now the finest fiber technology is combined with the worldwide support of Racal-Milgo. The result is Racal-Quanta, a company born of commitment to the most reliable fiberoptic products and services available.

Because we're so confident that you can depend on Racal-Quanta fiber modems and muxes, we're guaranteeing their flawless operation for one year. Should you have a problem, it's no problem. Because at no cost whatever, you can depend on Racal-Milgo's nationwide team of over 400 field service personnel for on-site repair or replacement. All service technicians are prompt, highly trained and well-equipped. See for yourself — take us up on our bonus offer of free installation of your first two units.

Racal-Quanta fiber products bring efficiency and economy to local area communications. Ideal for campus, multi-story, or office environments, our modems and muxes help you take advantage of fiber's special characteristics. Cost-effective, compact, and easy to install, the lines are immune to all types of electrical interference and extremely secure from intrusion.

For additional information, just call us toll-free 1-800-328-2668 (in California 1-714-970-2966).

For problem-free fiberoptic systems, reach for Racal-Quanta, the company that's reaching beyond today's standards.

Offer expires 12/31/89. Call or write today.

Racal-Quanta®

A Division of Racal Data Communications, Inc.
5415 East La Palma Avenue, Anaheim, CA 92807-2022 RACAL

Valid in the contiguous United States and Hawaii only. Free installation limited to two units per customer.

MANAGEMENT BRIEFS

NCGA seeks nominations

The National Computer Graphics Association (NCGA) is seeking nominations for its 1990 Individual Achievement Awards. The awards recognize outstanding achievement within the computer graphics community.

Award categories include executive of the year, award for technical excellence, award for the advancement of computer graphics, academic award and award for the advancement of computer graphics standards.

The NCGA will also present awards recognizing advancement of microcomputer-aided design and drafting (Microcadd) technology.

Categories include the following: NCGA Microcadd academic award, the Microcadd application award and the Microcadd award for the advancement of computer graphics.

Winners of the awards will receive a free full-conference registration to the NCGA '90 conference, which will be held March 19-22 in Anaheim, Calif. They will also receive a plaque and recognition at the 1990 NCGA awards dinner.

For more information, contact NCGA, Suite 200, 2722 Merrilee Drive, Fairfax, Va. 22031. Deadline for nominations is Dec. 1.

Steam Is Invisible To The Naked Eye.

☐ True

☐ False

UNIX® System V Delivers More Than Vaporware.

☐ True

☐ False

It may surprise you that the first statement is *true*. Only after steam cools does it become visible.

The second statement is also *true*. With the introduction of UNIX® System V Release 4.0, our promise of secure, standard UNIX system computing is fulfilled. Applications written for System V, Xenix,® Berkeley BSD, or SunOS™ are now compatible with Release 4.0, thanks to a few superior new features.

A new Application Binary Interface definition (ABI) ensures that your applications will run on many different computers, under many variations of UNIX software.

A new utility, called Application Source Verifier 1.0 (ASV), helps you measure how easily existing applications can be ported to System V, or verify the compatibility of applications currently in development.

And System V/MLS provides complete security for data contained in your interactive UNIX systems. It's easy to administer, and allows you to specify a variety of security levels.

For source code licensing information on all UNIX System Software, call 1-(800)-828-UNIX, ext. 112.

Software For The Open-Minded.

AT&T
The right choice.

1989 AT&T
UNIX is a registered trademark of AT&T.
Xenix is a registered trademark of Microsoft Corporation.
SunOS is a trademark of Sun Microsystems, Inc.

Hollywood

FROM PAGE 77

been able to get a lot of consensus among corporate and divisional people."

Despite his enchanting surroundings in storied Universal City, Brenner says his job is comparable to that of any other IS director.

"Managing the IS needs of a studio lot is no different than a large aerospace organization," he says. "There are lots of unions, different skilled people, and we have to keep track of who is where and pay those people."

Brenner feels strongly that his attitude is not shared by others. He says he gets caught up in the same prejudice that actors have been enduring since time immemorial. "Despite the fact that I could do their job, that aerospace plant wouldn't hire me; neither would a bank," he said. "There is a perception that I'm not a manufacturing data processing person."

Brenner divides the firm's 11 divisions as separate-but-equal entities, with each sporting its own IS director. Brenner sits atop the pile, with an annual budget of $24 million and 200 staffers reporting to him. "We're the central office of a very decentralized organization," he says. "Basically, I'm a consultant to the company at large."

Monthly meetings unite the directors at the Universal City lot, while biannual meetings bring together managers scattered across the country.

Although this slicing up of power is a bit unusual, Brenner manages to pull it off. "It's still a challenge," he concedes. "I'm a problem solver, but I still have to convince people that I should be invited into the problem definition, even when it's not even conceived as a problem. So I have to be the super snooper."

To manage the dispersal of information within MCA, Brenner views the firm as a three-tiered managerial structure. At the highest level are the top decision makers, who are fed only small pieces of relevant information. At the lowest level are the information gatherers. Between the two lies what Brenner calls the executive management system.

"We [in IS] are essentially information processors who need to control not only the quantity of the information, but the quality," he said. "I have no special techniques other than to understand what information people need and not belabor them with stuff they don't need."

Realizing the value of IS

MCA's chargeback system also ensures that computer services are not taken for granted. Each department is billed for its computer usage and service. "Each department must realize the value of MIS," he said. "I manage it as an asset and run it as a service. We're a business within a business, and that's how we operate."

Only a short walk from his office is the MCA data center in which resides Brenner's computational arsenal: an IBM 3090 Model 200 with 1,700 users tied into it and an AT&T 3B2 Model 700 minicomputer with 125 people on-line nationwide. Thirty-two local-area networks unite more than 1,000 personal computers on the Universal lot.

Surrounding this high-tech haven is the stuff that Tinsel Town dreams are made of. Tom Selleck and Peter Falk have offices only a few steps away from Brenner's. The writers for *Murder, She Wrote* are one wall over. Despite Brenner's claim that it is just a place to work, an edge comes to his voice when he talks about his surroundings.

"We invent things that have never been done before," the native New Yorker says. "That's what makes this job demanding, but that's what makes it exciting, too."

Brenner has spent well over half his life in the computer industry. He began in 1964, working his way through college at an NCR Corp. service bureau, where he processed optical scanning tapes from cash registers.

While Brenner says he enjoys his job, he looks for a future role as the chairman of a company. "Any good IS executive has a tremendous amount to offer an organization," he says. A quick look at the information technology on the Universal Studios lot is convincing evidence of that.

MULTIPLE
CHOICES.
Only One Right Answer
The Multi-Tech solution for multiple speeds
If you've been discouraged by the choices in 9600 bps modems, it's time to consider the new MultiModemV32, from Multi-Tech Systems.
One choice—no need to switch
You'll get everything you need in a V.32-compatible modem, including speeds from 300 bps up to 9600, MNP® and V.42 error correction, MNP® data compression, remote configuration and callback, and both dial-up and 4-wire operation.
Multi-Tech is the right answer
With the MultiModemV32, you'll get a modem with true upward and downward compatibility, from a most reputable company, at a most affordable price. For more information, call us at 1-800-328-9717.
Multi-Tech has even more right answers. We deliver a full line of data communications products, including modems, statistical multiplexers, LAN systems and 3270 emulators.
MultiTech Systems
The right answer every time
Multi-Tech Systems, Inc.
2205 Woodale Drive
Mounds View, Minnesota 55112 U.S.A.
(612) 785-3500 (800) 328-9717
U.S. FAX (612) 785-9874
International Telex 4998372 MLTC
International FAX (612) 375-9460

Sailing Craft Often Travel Faster Than The Wind.

☐ True

☐ False

UNIX® Software Development Is Easy, Fun, And Fast.

☐ True

☐ False

You may be surprised that both statements are *true*. Slippery, low-friction hulls can push modern boats across the wind at twice its speed.

And, good developers can sail through UNIX System V, with the OPEN LOOK™ graphical user interface (GUI). It puts System V's networked graphics power just a mouse-click away, so developers and application users become more productive quickly. Specialized applications become easier to develop, and networks become easier to manage. Building custom interfaces can be a snap, or should we say, a click.

There are many OPEN LOOK GUI applications to bring on board, and more are on the way. Important developers like Oracle® are tailoring their most popular products for OPEN LOOK GUI, as are leading computer makers. Their support has helped make OPEN LOOK software the first,best,open GUI for UNIX systems.

For source code licensing information on OPEN LOOK GUI and new UNIX System V Release 4.0, call 1-(800)-828-UNIX, ext. 212.

Software For The Open-Minded.

AT&T
The right choice.

© 1989 AT&T.
UNIX is a registered trademark of AT&T. OPEN LOOK is a trademark of AT&T.
Oracle is a registered trademark of Oracle Corporation.

CALENDAR

"Inventing the Future of Computing and Communications" will be the theme of a two-day interactive seminar scheduled for Dec. 6 and 7 in Cambridge, Mass.

The conference will address questions such as: What is the role of standards vs. proprietary technology in the 1990s? Will the client/server model dominate? Will the U.S. see further erosion of its market share by international suppliers? Will the network computing model be the next major computing paradigm?

Conference sponsors Patricia Seybold's Office Computing Group and Northeast Consulting Resources, Inc. said the conference will be geared to those involved in planning computer and communications technology as well as computer management, development and marketing.

For more information, contact Patricia Seybold's Office Computing Group, Suite 612, 148 State St., Boston, Mass. 02109 or call Deborah Hay at (617) 742-5200.

NOV. 26-DEC. 2

GIS/LIS '89 Conference and Exposition. Orlando, Fla., Nov. 26-30 — Contact: GIS/LIS '89, 210 Little Falls St., Falls Church, Va. 22046.

When Should You Consider Optical Disks? Detroit, Nov. 27-28 — Contact: Pat Paletra, Optical Disk Institute, P.O. Box 289, Newton, Mass. 02160.

Cause '89. San Diego, Nov. 28-Dec. 1 — Contact: The Association for the Management of Information Technology in Higher Education, Suite 302E, 4840 Pearl E. Circle, Boulder, Colo. 80301.

Configuration Management Seminar. Seattle, Nov. 28-30 — Contact: University of Washington Extension, GH-24, 5001 25th Ave. N.E., Seattle, Wash. 98195.

Infosec '89, Practical Perspectives on Computer and Networking Security. Mountain View, Calif., Nov. 28-30 — Contact: Advanced Computing Environments, Suite 100, 480 San Antonio Road, Mountain View, Calif. 94040.

OSI Product Integration Conference. Washington, D.C., Nov. 28-Dec. 1 — Contact: Conference Manager, Suite 221, U.S. Professional Development Institute, 1734 Elton Road, Silver Spring, Md. 20903.

Achieving Lights-Out Data Centers Conference. Washington, D.C., Nov. 29-30 — Contact: Nelson Moskowitz, Manufacturing Institute, 23rd Floor, 437 Madison Ave., New York, N.Y. 10022.

Macintosh Business Conference & Exposition. Long Beach, Calif., Nov. 29-Dec. 1 — Contact: Nancy Thayer, MBC&E, 1 Forbes Road, Lexington, Mass. 02173.

Chicago Quality Assurance Association, Project Management Showcase. Chicago, Nov. 30 — Contact: Julie Gerken, AON Corp., 5050 N. Broadway, Chicago, Ill. 60640.

Disaster Recovery Planning. New York, Nov. 30-Dec. 1 — Contact: Vern Lautner, 135 W. 50th St., New York, N.Y. 10020.

LAN Forum 1989 Conference. Atlanta, Nov. 30-Dec. 1 — Contact: Paul A. von Wupperfeld, Infolan Seminars, P.O. Box 162323, Austin, Texas 78716.

DEC. 3-9

Automated Data Center Seminar. Newport Beach, Calif., Dec. 4-5 — Contact: KPMG Peat Marwick Main & Co., Executive Education Registrar, 3 Chestnut Ridge Road, Montvale, N.J. 07645.

International Conference on Information Systems (ICIS). Boston, Dec. 4-6 — Contact: Judith Quillard, ICIS '89 Planning and Arrangements Chair, MIT, Cambridge, Mass. 02139.

Managing IS in the 1990s. Washington, D.C., Dec. 4-5 — Contact: Laurie Goudreau, Ouellette & Associates, 40 S. River Road, No. 66, Bedford, N.H. 03102.

Supporting End-User Strategies. Washington, D.C., Dec. 4-6 — Contact: Technology Transfer Insitute, 741 Tenth St., Santa Monica, Calif. 90402.

Database World Conference & Exposition. Boston, Dec. 5-7 — Contact: Digital Consulting, Inc., 6 Windsor St., Andover, Mass. 01810.

Information Systems Strategies. Los Angeles, Dec. 6-7 — Contact: Business Week Executive Program, 1221 Ave. of the Americas, 36th Floor, New York, N.Y. 10020.

EIS '89. Washington, D.C., Dec. 6-8 — Contact: Elisabeth Simpson, The EIS Institute, 174 Cabot St., Newton, Mass. 02158.

Graphics and Image: The New Revolution. Santa Clara, Calif., Dec. 7 — Contact: International Data Corp., P.O. Box 955, 5 Speen St., Framingham, Mass. 01701.

'90s Outlook for Knowledge-Based Systems. Arlington, Va., Dec. 7 — Contact: Ricki Kleist, Software A&E, Suite 500, 1600 Wilson Blvd., Arlington, Va. 22209.

The last thing you need when developing complex software applications is a toolset that has a mind of its own. So naturally, we designed our SILVERRUN™ CASE Toolset to work the way you think—enhancing the analysis and design process rather than hindering it.

SILVERRUN allows design groups to implement CASE capabilities incrementally, yet share data between modules.

A modular, powerful and affordable CASE Toolset.

Not only is SILVERRUN a fast and powerful developer-driven toolset, it's also one of the most affordable on the market. After all, we designed SILVERRUN to be modular. And since each module has been conceived to excel at specific job tasks, you buy only what you need, when you need it.

Industrial-strength modeling.

With SILVERRUN, you're not limited or constrained in terms of model size, number of attributes, or levels of detail. And though each module can be used separately, they are logically integrated to provide a smooth exchange of design data between modules, as well as easy import and export of data with other CASE tools.

See what you think. Call for a free demo diskette today.

Find out why developers worldwide are using SILVERRUN to work more intuitively and effectively than ever before, with results that boggle the mind.

For more information or a demonstration diskette, call (800) 344-9223, in Canada (800) 344-9224.

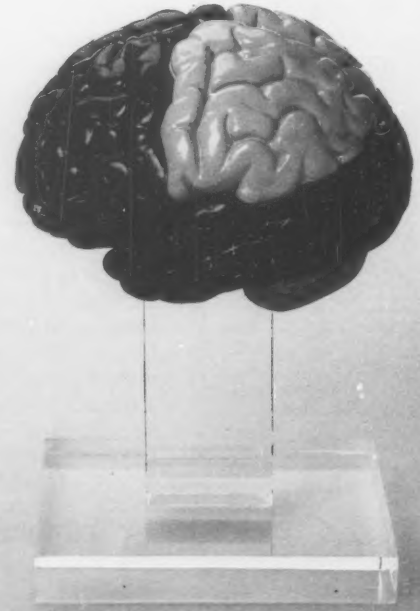
The SILVERRUN CASE Toolset from XA.

We think it's time you let success go to your head.

XA SYSTEMS CORPORATION

Commitment: The easiest to use and easiest to justify products in the business.

Ours is the only CASE tool designed to work with this peripheral.



SILVERRUN is a trademark of XA Systems Corporation.

Small wagers can pay off, but don't bet the farm

BY ALAN RADDING

The odds given for Integrated Services Digital Network (ISDN) at Harrah's Reno sound about the same as those offered by the majority of early experimenters. "I believe ISDN is the wave of the future," says Donald Benedict, director of MIS at the hotel/casino complex, "but it isn't here yet."

What is interesting is that although the result is the same — a decision to go slower in the future with wagers on ISDN — Harrah's doubts are not about the technology involved. What is at issue for the hotel/casino is whether the world is ready for what ISDN can do.

The goal that Harrah's had in mind when it began its first test of ISDN in April was cutting down on the delays involved in room registration, speeding its customers toward their ultimate destination — the gaming tables. The way it hoped to do this was by installing an automatic reservation and check-in system at the Reno-Cannon International Airport in Reno, Nev. Its test involved using an ISDN circuit to connect an electronic kiosk at the airport with the hotel reservation desk.

The system worked like this: Upon arrival at the airport, a traveler intending to stay at Harrah's would go to the kiosk and enter his room request using a screen menu. A desk clerk from the resort would appear on a large monitor and speak directly to the customer, who could respond by using a handset attached to the kiosk. The terminal also contained a magnetic card reader to handle credit cards and a camera that would capture an image of the person and transfer it as a facsimile image to the hotel.

When the customer reached the hotel, a doorman who recognized him from the fax image would greet him personally at the door, take his luggage and hand him the room key. While the bags were transferred to his assigned room, the customer would be free to proceed straight to the casino.

Although this planned sequence was seldom completed successfully during the trial period, Benedict is not blaming the technology. The equipment functioned just fine, he says; what jinxed the project was the human element.

The only problem, Benedict explains, was that the system "physically scared people." The majority of those who activated the system ran away when a clerk appeared on the screen and began talking to them.

Eventually, Harrah's determined that the payoff from this ISDN application was not sufficient to justify continuation of the effort. Out of 70 or 80 people who walked up to the kiosk each day, no more than 10 would use it, Benedict says. "And 10 people a day simply didn't justify the cost of the system."

Folding one test does not mean that Benedict has given up on ISDN. It does mean, however, that he will wait awhile before trying to put some of his other plans into practice.

TRENT SAVIERS

Harrah's Benedict *says ISDN will pay off big in the future*

The waiting game

Many organizations, including those with successful ISDN trials, seemed to have reached the same conclusion — ISDN looks promising, but high-stakes involvement is still a wait-and-see proposition.

ISDN is being billed as the next stage in the ongoing evolution of the public switched telecommunications network. When it is finally deployed, it will provide end-to-end switched, high-speed digital telecommunications. Users will be able to transmit and receive simultaneous voice, data and images over existing telephone wiring.

The trouble is, however, that ISDN service is still far from full readiness.

One indicator of current limitations is the number of lines activated to provide either Basic Rate Interface (BRI) or Primary Rate Interface (PRI) service. BRI delivers a configuration of two 64K bit/sec. channels (the B channels) for voice and data and one 16K bit/sec. channel (D channel) for signaling and packet switching. PRI provides 23 B channels and a 64K bit/sec. signaling channel.

The plan is for PRI to connect switches while BRI is used from the switch to the user's desk. Many firms are frustrated with ISDN because it does not appear to offer anything today that determined telecommunications users cannot already get.

By the end of 1988, the New York-based market research firm Frost & Sullivan, Inc. estimates, there were 69,000 BRI access lines in service. A more conservative count from Kanupke Associates in Haddonfield, N.J., puts the number at 45,000, with only 30 PRI lines in use.

Whichever figure is closer to reality, the message is roughly the same: ISDN lines currently account for only a minuscule fraction of telecommunications wiring across the country.

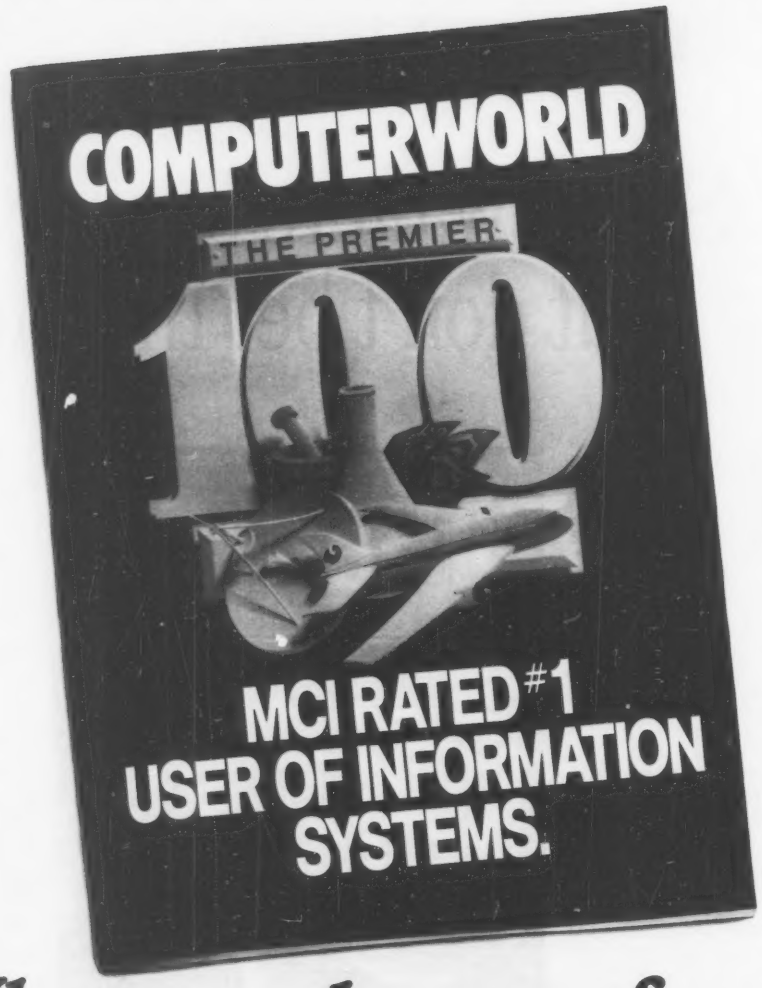
Where ISDN is available, proponents contend, it already

Radding is a Newton, Mass.-based author specializing in business and technology.

INSIDE

Can ISDN and OSI work together?
Page 93

Promises of long-distance data services
Page 95



Why good news for us is great news for you.

Recently, *Computerworld* named MCI® the most effective user of information systems in the country.

In their view, MCI did the best job managing information technology to achieve one of our key business objectives: To be the most flexible and responsive communications company.

A similar survey in *InformationWEEK* also rated us an industry leader.

Which is certainly good news for us.

But even better for you.

Because it's your assurance that as an MCI customer you'll have that same expertise working for you. Introducing new products with the features you want. Building you the most efficient network possible, with state-of-the-art advances. And giving you the tools to manage it yourself.

We believe that all of this indicates just how hard MCI is working to meet our business objectives. And how well we can help you meet yours.

For more information, contact your MCI Account Representative or call **1-800-888-0800.**

MCI®

Let us show you.®

© MCI Communications Corporation, 1989

Small wagers

FROM PAGE 85

delivers significant advantages, which will multiply in the future as its use expands.

First, there is greater bandwidth and much higher speeds. "ISDN gives a user a 64K bit/sec. link through the network to the user's terminal. By comparison, most users have 2.4K to 4.8K bit/sec. Maybe a few have 9.6K bit/sec.," says Olga Mitchell, district manager of ISDN applications at Bellcore in Princeton, N.J.

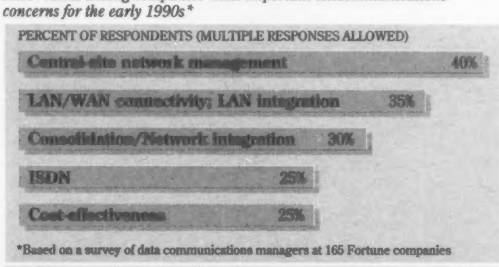
The higher speed and greater bandwidth, Mitchell says, will let users exchange different media, including compressed video.

offer now that cannot be achieved some other way, such as putting together a network of private nonswitched leased digital T1, fractional T1, T3 and 56K bit/sec. lines.

Undeniably, a worldwide standard for switched digital service over the public network could offer many advantages over private, leased lines between two points. Economies of scale would make for lower service and equipment costs. Integration would be easier. Furthermore, organizations could take advantage of the flexibility inherent in a public switched network, accessing features on a dial-up basis and configuring and reconfiguring the network on a call-by-call basis.

High priority

*ISDN ranks among companies' most important telecommunications concerns for the early 1990s**



*Based on a survey of data communications managers at 165 Fortune companies

SOURCE: NEWTON-EVANS RESEARCH CO. CW CHART: JOHN YORK

More importantly, she says, ISDN will significantly improve audio and allow users to do several things simultaneously with one line. For instance, ISDN will allow several users to speak to one another while simultaneously viewing the same computer screen, a feature called screen sharing.

A more prosaic but significant potential advantage of ISDN is the elimination of the need to wire new workstations. In the future, data terminals, workstations and voice telephones will all share the same wiring. There will be no need to run coaxial cable to connect workstations. One phone line will serve voice and data simultaneously.

Modems will also be unnecessary in the all-digital ISDN world, although terminal adapters of some sort will be required.

ISDN will also provide such highly touted goodies as automatic number identification (ANI). With ANI, telemarketers and customer service representatives can identify the caller before they pick up the phone.

If ANI is interfaced with a database, a customer service rep can have a customer file on his screen the moment he answers the call. Incoming calls, even those that are not answered or from those who hang up before leaving a message, are identified and filed for later call-back.

However, users and the consultants who advise them say that when you look closely, there is not a great deal that ISDN can

"We have computers in a lot of different places. It would be very convenient to have easily available, switched digital service to use for, say, two hours a day to download data and get away from 9.6K [bit/sec.] dial-up," says John Fulton, assistant vice-president and manager of network and communication systems research at Huntington Service Co., a division of Huntington Bankshares in Columbus, Ohio, a bank holding company.

Roughing it

The sticking point is in Fulton's descriptive phrase, "easily available." Users cannot really benefit from ISDN until the full network is in place and products and applications are readily available. According to many telecommunications consultants, those conditions are far from being fulfilled.

"I'm always very careful to use the word 'rudimentary' when talking about ISDN. So far, only the most basic applications are being provided. The more sophisticated applications are still in the future," says H. Paris Burstyn, director of telecommunications research at the Business Research Group in Newton, Mass.

"Is there something happening with ISDN for users?" quips Geoffrey Tritsch, principal of The Tritsch Group in Medfield, Mass., a telecommunications consulting firm. The benefits today, he says, are for ISDN vendors: "For users, ISDN doesn't provide an immediate solution to anything."

"I have zero reservations about ISDN from a technical perspective. My biggest reservations are the way deployment is projected. It is not going to be painless or rapid," says Thomas Nolle, president of CIMI Corp. in Haddonfield, N.J., a telecommunications consultancy and ISDN applications developer.

Implementing ISDN adds a level of complexity and requires a lot of changes, agrees James McCormick, a partner at Eastbourne Consulting Group in New York. In order to make it worthwhile, McCormick says, "the savings or advantages would have to be substantial."

Missing pieces

Like Harrah's, however, what most early implementors seem to be finding is that although ISDN does work and can offer some advantages, there is almost always something critical missing.

For example, at Westinghouse Communications Systems Division in Pittsburgh, tests of ISDN yielded distinctly mixed results.

In one effort, the company hooked up terminals through a controller to the IBM mainframe using dial-up ISDN lines rather than coaxial cable. That particular test worked very well, according to Ralph Krichbaum, the division's manager of technical planning; it gave him some ideas for even more ambitious uses of data transfer over BRI lines.

"There is a lot of appeal to dial-up 56K or 64K bit/sec.," Krichbaum says. "At that speed, we could take a terminal to a customer's office, plug it into the phone line, dial up the computer and demonstrate software."

Despite his enthusiasm, however, Krichbaum finds the current state of ISDN technology, as revealed by another test, extremely frustrating.

In a Group 4 fax test, Krichbaum says, the company discovered that ISDN equipment lacked all the amenities that make faxes productive in the corporate environment.

"In most companies, the fax machine can store 100 numbers. So, you just drop in your documents, push a couple of buttons and walk away," he says. "But the ISDN fax machine lacked an autodialing feature, so we had to dial the entire number [rather than a speed-dialing 2-digit code] and then push another button to establish the 64K bit/sec. circuit. Then you have to hit the transmit button."

Technically, the ISDN fax transmission worked well, but the extra button pushing is unacceptable. Another problem is the need for attended operation, which prevents the company from queuing the less important faxes for automatic transmission overnight when rates are lower and demand is lighter.

"Sure, [automatic transmission] will be there when ISDN really hits," Krichbaum says, "but it isn't there now."

Although less than satisfied with the current state of the technology, Krichbaum is doggedly pursuing ISDN because of its promise of standardization for digital telecommunications, to

Westinghouse's Krichbaum

which Westinghouse is committed. "Now, we have to match digital phones to the PBX vendor" or face compatibility problems, Krichbaum explains.

When the world standardizes on ISDN, he adds, compatibility will not be a problem: "We'll just be able to move the phone and plug it in, like analog. Today, it is not easy to move surplus digital equipment."

At General Electric Co.'s Telecom Group in Bridgeport, Conn., Jerome King, manager of telecommunications technology, has found a very specific use for ISDN technology. According to King, by replacing coaxial cable with ISDN lines as the medium connecting terminals to a cluster controller, the company has been able to improve wiring efficiency.

The technology works fine for light-duty workstations, King says. In that case, he uses the B and D channels over a twisted-pair cable. "We don't dedicate a full port. We'll queue through the controller," he explains. For a heavy-duty workstation, he says, he still prefers to use the Token-Ring network because of its speed.

It takes two weeks, however, to get a new workstation wired for the Token-Ring network. In the meantime, he notes, "We'll

GE's King

bring it up with ISDN," concluding that "within a building, a LAN is a lot better."

Otherwise, GE is already doing much of what ISDN promises with its private lines. By segmenting its toll-free numbers and giving large customers special access codes, the company essentially has caller identification. Through intelligent multiplexers on its T1 lines, GE can virtually reconfigure the network on the fly.

"We can't do it on a call-by-call basis, but we can do it with a 15 minutes lead time, even for video," says King, unsure of whether he ever wants more flexibility than that from a management control standpoint.

Feet first

"We skipped the trial and jumped right in when we implemented a couple of thousand ISDN lines," says Russell Roy, manager of telcommunications at Tenneco Gas in Houston. At times, Roy says, the reliability of the ISDN service was questionable, but "in the last two months, things have improved."

Intermittent problems with the central office software appear to have been solved. Trouble reports have decreased by 30% to 40%, and the situation is no worse than with Tenneco's conventional system.

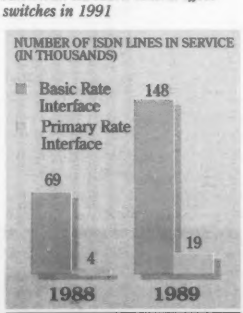
ISDN has worked particularly well for Tenneco's personal computer terminals. "Nearly every PC is plugged in," Roy says. By accessing ISDN through an RS-232 port on the back of each ISDN telephone, Tenneco has eliminated the need for hundreds of modems, he reports.

Instead, PCs feed a shared modem pool. Also, users can share laser printers by simply calling the laser printer nearest them. Even software updates can be centrally distributed.

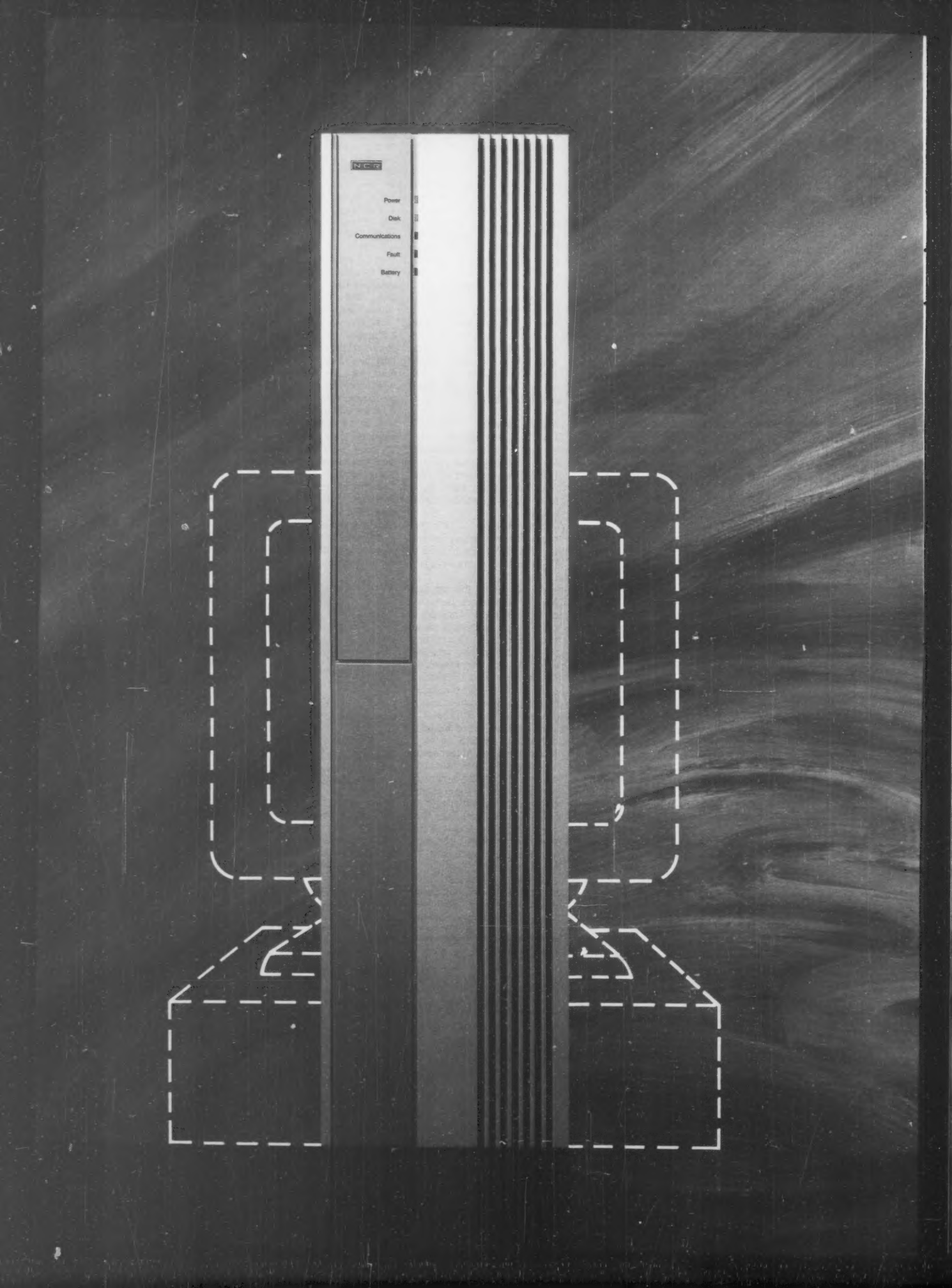
Tenneco's problems have been on the voice side. The ISDN phones do not work exactly like the old multibutton electromechanical telephone sets. The users most dissatisfied with the new phones, according to Roy, "are those who typically

Line count

The number of ISDN access lines has grown slowly and is not expected to pick up until the availability of North American standard central office switches in 1991



SOURCE: FROST & SULLIVAN, INC. CW CHART: JOHN YORK

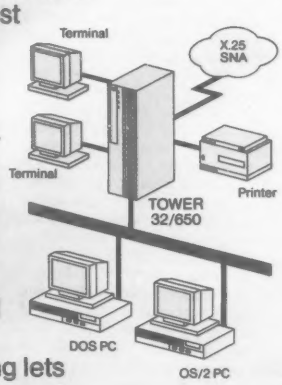

NCR
Power
Disk
Communications
Fault
Battery

WE'VE RESHAPED THE CONCEPT OF THE LAN SERVER.

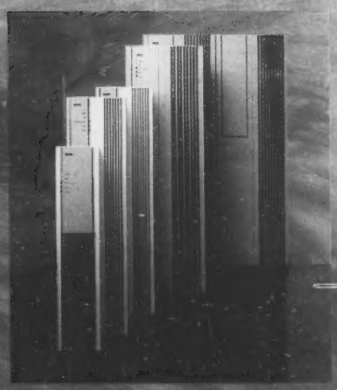
At last there's a LAN server that overcomes the limitations of DOS-based PC servers at a comparable price.

Using Portable NetWare,® NCR and Novell® have developed a powerful new version of NetWare for the NCR Tower® family. This breakthrough gives the family compatibility with workstations running on NetWare networks—now and in the future.

Its multitasking and rich communications and networking capabilities let one Tower replace multiple PCs. It can communicate with a high-order host while running any UNIX® system application, handling peer-to-peer communications, and acting as a print and file server. DOS-based PC servers can perform only one task at a time.



The scalable processor architecture of the Tower family means you can easily migrate to a more powerful Tower as your LAN management needs increase. So you can connect workgroups by function rather than splitting them up based on the capacity of the server.



Finally, UNIX system networking lets you perform configuration management, software distribution, and other system management functions not available on DOS-based systems.

Of course, each Tower comes with all the features and support that has made our family the best-selling line of multiuser commercial UNIX systems in the country.

Backed by NCR's decade-long commitment to the theory and practice of open systems technology.

To find out more about the advantages of using the NCR Tower as a LAN server, phone 1-800-CALL NCR.

We'll tell you how to put the power of Tower at your service.

THE NCR TOWER FAMILY.

We're Shaping The Future
Of Client/Server Computing.

NCR

Creating value

Tower is a registered trademark of NCR Corporation. UNIX is a registered trademark of AT&T. Novell and NetWare are registered trademarks of Novell, Inc.

Bob—
HAVE YOU GIVEN
THESE PEOPLE A
CALL YET? TOM

FIRST LOOK

DCA's Convertible: Is It IRMA? Or Sybil?

By David Strom

Though officially dubbed the IRMA 3 Convertible, a more accurate moniker for the new multiple-personality board from Digital Communications Associates Inc. (DCA) would be Sybil. A few deft twists of the wrist, and the board adopts whatever persona or configuration is needed at that moment.

The wealth of choices—Micro Channel or AT bus, coaxial or twisted-pair cabling, IBM- or IRMA-style emulation—makes DCA's board an engineering marvel. At the same time, however, the Alpharetta, Ga., firm wisely borrowed some tips from its competitors. For example, it uses single application-specific chips à la Novell Inc.'s PCOX, a nifty configuration utility à la Attachmate Corp.'s board, and two items found on many products: a built-in balun for twisted-pair wiring and downloadable microcode that makes upgrading firmware less painful.

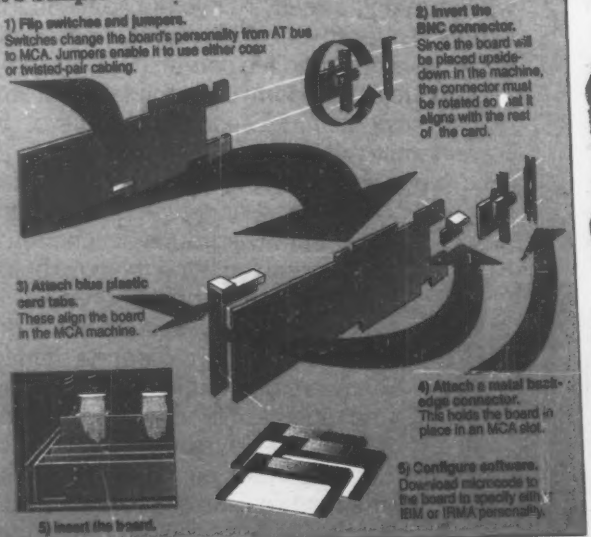
But one thing the Convertible has that all others lack is the ability to run on all current PCs—Micro Channel architecture (MCA), PC and AT alike. And switching from classic bus to MCA takes even the most fumble-fingered user just a few minutes: Simply remove the back-edge connector, flip a series of switches, invert the business end so that the coax Bayonet Nut Coupling connector is aligned with the rest of the card, and put everything back together.

We tried several 3270 software packages, including DCA's e78, e78 Plus and Crosstalk Mk.4, Relay Communications Inc.'s Relay Gold, Attachmate's Extra! and IBM's 3270 Emulation Program version 3.0. When the Convertible was configured as an IBM board supporting distributed-function terminals, the IBM, Attachmate and Relay emulation software worked flawlessly on both machines; this included the multiple-session support that Extra! provides.

TSO IND$FILE file transfer also worked well with the IBM and Attachmate products.

DCA's IRMA 3 Convertible Rides Either Bus

It's Simple To Switch from Standard Bus to MCA


1) Flip switches and jumpers.
Switches change the board's personality from AT bus to MCA. Jumpers enable it to use either coax or twisted-pair cabling.
2) Invert the BNC connector.
Since the board will be placed upside-down in the machine, the connector must be rotated so that it aligns with the rest of the card.
3) Attach blue plastic card tabs.
These align the board in the MCA machine.
4) Attach a metal back-edge connector.
This holds the board in place in an MCA slot.
5) Configure software.
Download microcode to the board to specify either IBM or IRMA personality.
5) Insert the board.

John Avalon

As far as we could determine, our software functioned identically when the Convertible board was swapped for IBM 3270 hardware. All we needed to do ... ure the DCA p... download the ap...

All three DCA ... lay, functioned we... the board to run a... (CUT)-mode IRMA... were unable to ru... ured as a CUT-mod...

and 1.31 of Extra! did not dis... orrectly formatted ...

Customer Representative
Marketing Information Group

DCA

1000 Alderman Drive
Alpharetta, GA 30201-4199
1-800-241-4762, Ext. 55
In Georgia 404-442-4500, Ext. 55

DCA/IRMA 3 Convertible

DCA is a registered trademark and IRMA 3 Convertible is a trademark of Digital Communications Associates, Inc. Reprinted from PC Week, May 8, 1989.
©1989 Ziff Communications Company. ©1989 Digital Communications Associates, Inc. All rights reserved.

operate in the mode of an executive and an assistant."

In cases in which the executive has two telephones, he cannot access all of the intercom lines on both phones from one phone. If an assistant places a conference call for the executive, the executive will not be able to simply pick up the call, as he can with his old-fashioned multibutton phone.

User frustrations

Depending on what they are trying to accomplish, early ISDN implementors are concerned with the biggest drawbacks to ISDN, such as slowness of deployment, persistent high costs, lack of compatibility or the dearth of applications.

Pace of deployment may be the most common frustration. In what is often referred to as "islands of ISDN," the technology is available only at selected switches throughout the country as the Bell operating companies slowly convert each office.

In Chicago, Illinois Bell has initiated true commercial ISDN, but Pacific Bell has been slow to deploy the technology, says Byron Belitsos, a telecommunications consultant in San Francisco.

The result is that organizations may use ISDN internally but cannot use ISDN to connect with sites across town, across the state or throughout the country. "We don't have door-to-door service. You can use [ISDN] in a metro area if you are lucky, or just in your office," notes Steve Martin, a manager at Touche Ross & Co. in Washington, D.C.

For instance, Tenneco Gas cannot extend its ISDN network to its remote sites "until ISDN is deployed to rural America," Roy notes, which may take a very long time.

Cost is another problem. ISDN tariffs are not set in most cases, so users cannot calculate the cost/benefit of ISDN for planning purposes. In areas that costs are known, they tend to be high — particularly customer equipment costs. An ISDN telephone can cost from $500 to $1,200, compared with $200 for a standard sophisticated business telephone.

Of course, there is another side to the argument. With call-by-call service selection, users can reduce the number of dedicated trunks they are using by one-third, according to Nolle.

In addition, the need for a modem on every workstation is eliminated, and there are significant savings in wiring. "It costs a company as much as $1,200 per year per terminal for moves and [wiring] changes, depending on its location and the union situation," says Harvey Cohen, senior consulting partner at BIS CAP International, Inc. in Norwell, Mass. More savings come from sharing voice and data over a single line, which eliminates the need for separate voice and data lines at each user's desk.

Still, ISDN has not yet reached a stage at which economies of scale bring costs clearly on par with other telecommunications options. What users are waiting for is the projected decrease in equipment costs. When combined with tariffs that are equal to or less than those for comparable service, investing in ISDN may then be more easily justified.

Compatibility is another problem. Because standards are still evolving, there is a lack of compatibility between ISDN central-office switches, private branch exchanges and customer equipment from different vendors. The compatibility problem is even frustrating a Bell operating company, as it tries to extend ISDN to its own users' desktops.

"There are competing protocols for telephone sets, and they are incompatible," complains Robert Searl. As director of corporate telecommunications at Bell Atlantic Corp. in Falls Church, Va., Searl approaches ISDN from a user's point of view.

Increased sophistication ahead

Users also complain about a lack of sophisticated applications, but as the market expands, that situation should improve. Potential developers such as Nolle are waiting until there is enough of a market to justify developing applications. Some regulatory issues must also be resolved, particularly in regard to automatic number identification.

"I'm ready to experiment with ISDN, but I'm not spending any money to link databases until I get the regulatory approval," says Bob Brunson, director of telecommunications at City Federal Savings in Somerset, N.J.

Finally, ISDN requires a new kind of telecommunications department because an intelligent network needs more sophisticated support. MIT created an extensive internal ISDN network, but the amount of effort required to develop and support that network surprised Morton Berlan, director of telecommunications systems at MIT. "It is frustrating to see the amount of administrative infrastructure that's needed," Berlan says.

The demands of ISDN have changed the makeup of the MIT telecommunications staff. According to Berlan, "We didn't upsize the support staff, but we changed some functions, and the kinds of people we need are different. We need them to be technically conversant. This is no longer POTS [plain old telephone service]."

Temporary difficulties

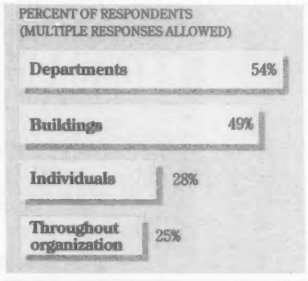
Users say they believe that many of the problems are temporary. The support demands, compatibility problems, costs and deployment issues will disappear as ISDN is rolled out through the first half of the 1990s.

In the meantime, users are squeezing enough productivity out of the early implementations to justify the effort, expecting to fully cash in on the investment by the middle of the decade.

"Right now, ISDN is at the 'gee-whiz' stage," says W. Edward Hodgson, manager of computing and communications at Westinghouse Elevator Co. in Morristown, N.J., a worldwide elevator manufacturer that is committed to being 100% ISDN. "It will allow us to become supercompetitive."

Isolated first steps

A survey of 233 large Canadian firms shows most expect to initially implement ISDN in "islands" within their organizations



SOURCE: ANGUS TELEMANAGEMENT GROUP, INC. CW CHART: JOHN YORK

The potential for ISDN is "only limited by our imaginations," he continues. He envisions that ISDN will be used to support Westinghouse Elevator technicians in the field by providing detailed schematics over the phone, thus enhancing customer service.

While ISDN remains in the gee-whiz phase, however, even ISDN proponents concede that quiet planning and small-scale testing are about as far as most organizations can really proceed. The mid-1990s will bring the real boon time, some suggest, and organizations should think in terms of readying themselves for an easy transition at that point.

Despite its disappointing first test, Harrah's Reno is not planning on waiting quite that long.

Benedict is exploring the use of caller identification to alert reservation clerks to preferred customers. Although the hotel is 100% full for half of the year, blocks of rooms are set aside to ensure that regular customers are not left without accommodations. It would be a considerable boon if clerks had an easy means of identifying these preferred guests.

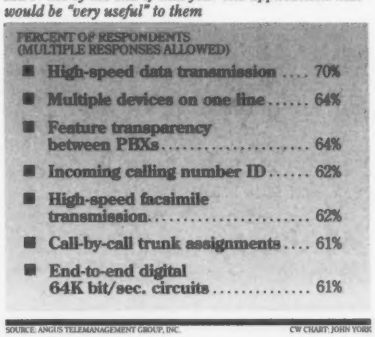
Another way that Benedict thinks ISDN may prove useful to the hotel/casino would be in making it possible for reservations work and other functions to be performed at remote terminals. This would allow Harrah's to tap the handicapped, mothers, retired individuals or others for hard-to-fill jobs in a state with very low unemployment.

Still another application, which Benedict places in the category of "really futuristic," would be remote video-betting terminals for racing and sports wagers, set up in convenience stores and other offsite locations throughout the state.

"We'll move slowly through 1990 and put some things into production by 1991," Benedict says. By that time, the telecom world and the public in general should be better prepared for ISDN. •

Most wanted

Canadian companies surveyed that are planning ISDN use by the end of next year cite applications that would be "very useful" to them


PERCENT OF RESPONDENTS
(MULTIPLE RESPONSES ALLOWED)
High-speed data transmission 70%
Multiple devices on one line 64%
Feature transparency between PBXs 64%
Incoming calling number ID 62%
High-speed facsimile transmission 62%
Call-by-call trunk assignments 61%
End-to-end digital 64K bit/sec. circuits 61%

SOURCE: ANGUS TELEMANAGEMENT GROUP, INC. CW CHART: JOHN YORK

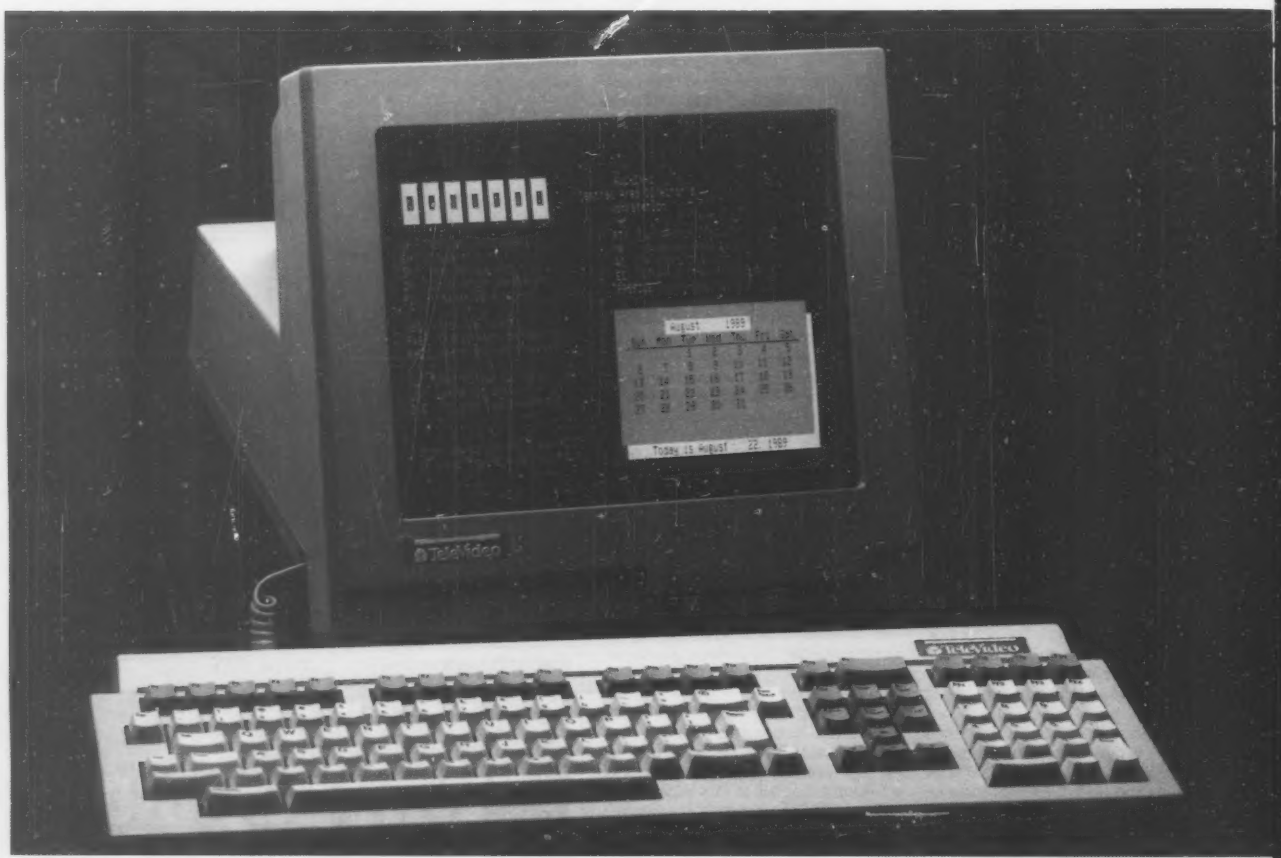
"Why pay more for a climbing rope? If it breaks, we'll give you a new one free."

It's easy to cut costs by cutting corners. But if you lose critical data, it's gone for good. When it's your business that's on the line, don't take chances with anything less than Dysan 100 flexible disks. We test 100% of our disks and certify 100% to be 100% error free over 100% of the disk surface.

The Dysan 100. It's not just a name. It's a measure of superiority.

Dysan·100
100% Better

Why VT320 Users Are Giving Their Nod Of Approval To Our 9320.



	TeleVideo 9320	DEC VT320
70 Hz refresh rate	Yes	No
10 x 14 character cell	Yes	No
2 pages memory cell	Yes	No
Tilt and swivel base standard	Yes	No
DB25 pin and DECconnect™ host and aux ports	Yes	No
Set-up programmable function keys	Yes	No
VideoDesk™ accessories	Yes	No
Dedicated Keys (Escape, Backspace, Linefeed)	Yes	No
Under $500	Yes	No

Make any comparison to the VT320,™ ask any question about our 9320, we can smile and nod "yes."

Want a display that's easier on the eyes? Our 9320 is flicker-free, with large, easy-to-read characters.

Need more memory than a DEC™ VT320 has? We give you twice as much, standard.

Wouldn't dedicated Escape, Backspace and Linefeed keys be much more functional? Our enhanced keyboard has them, for your convenience.

It has to be 100% compatible, right? The 9320 is a perfect match in any DEC environment. The ideal choice for any UNIX® or ANSI-based system.

The 9320 is built for reliability, with a single-board design, and backed by a one-year limited warranty. Plus a lot more, for less than DEC charges.

And the 9320 got *Digital Review's* nod of approval, too—receiving their 1989 Target Award as the "Best Alphanumeric Display Terminal" in the DEC market.

For more information fast, call toll-free or write today. TeleVideo Systems, Inc., 550 E. Brokaw Road, P.O. Box 49048, San Jose, CA 95161-9048.

As the comparison chart shows, we know how to make VT320 users, OEMS and VARs happier. Just give us the nod.

TeleVideo®

American Ingenuity. TeleVideo Know-How.

Call 1-800-835-3228

© 1989 TeleVideo Systems, Inc. TeleVideo is a registered trademark, and VideoDesk is a trademark of TeleVideo Systems, Inc. All other product and brand names are trademarks and registered trademarks of their respective holders.

Do ISDN and OSI need each other?

The two methods could do great things in tandem, users say, but vendors need to cooperate

BY MICHAEL HURWICZ

Wide-area networks and local-area networks are a natural duo. They have to harmonize to create the enterprisewide networks that many major users envision. However, for users who intend to base future LANs on Open Systems Interconnect (OSI) standards and future WANs on Integrated Services Digital Network (ISDN) standards, questions remain about how these two very different worlds will mesh. Observers seem to view the situation with equal parts of optimism, skepticism, worry and hope.

In some ways, ISDN and OSI seem extremely well suited for partnership because they address different but complementary needs.

ISDN's native domain is the WAN. OSI, however, has grown up on the LAN.

Similarly, the two standards have their roots on different sides of the voice/data divide. Although both can accommodate voice and data, ISDN is oriented toward voice services, while OSI is geared almost exclusively toward data applications.

For the most part, ISDN and OSI address different levels of sophistication.

Basically, the approved ISDN standards (CCITT Q.920 and Q.921) specify a means of pumping bits reliably from one place to another. A recommendation, CCITT Q.931, covers call setup and supervision, and by 1992, ISDN standards should include specifications for controlling higher level supplementary services such as call forwarding, call transfer and call waiting. Currently, however, there are no high-level applications defined by ISDN standards.

IN SOME ways, ISDN and OSI seem well suited for partnership because they address different but complementary needs. ISDN's native domain is the WAN. OSI, however, has grown up on the LAN.

OSI standards, on the other hand, include specifications for high-level applications such as electronic mail, file transfer and remote terminal access.

Looking at these differences, many see potential for an interworking arrangement in which ISDN WANs provide a moderate-bandwidth low-level transmission capability and voice-oriented services, while OSI LANs provide a high-bandwidth low-level transmission and data-oriented services such as electronic mail and terminal emulation.

Nor is talk of OSI-ISDN cooperation mere speculation. AT&T and the U.S. Air Force did a test last spring that proved that OSI and ISDN can work together, according to Tim Rubert, product manager at Teleos Communications, Inc. in Eatontown, N.J., a vendor of ISDN personal computer terminal adapters and access servers that was involved in the tests.

There are some possible impediments to widespread adoption of such combinations, however.

David Norem, assistant director of automated support and technology for the Office of the Assistant Secretary of Defense, says his agency is interested in using OSI and ISDN to do various sorts of conferencing. For example, he would like to allow two users to have a document or drawing on the screen, talk about it and make changes to it at the same time.

However, the relatively high-speed transmission of video information required by such an application requires a high bandwidth link. Everyone agrees OSI LANs can handle the job. But can ISDN?

Norem says he believes that the Basic Rate ISDN, which provides two 64K bit/ sec. channels and one 16K bit/sec. channel, will handle such video applications adequately. "A 64K bit/sec. channel can transmit still pictures quite well," he says. "And 128K bit/sec. will handle good-quality moving video." What's missing, he says, is good support in OSI for carrying voice and data together, so that users could transmit screens of information to one another and discuss that information at the same time.

Norem also thinks managing the two networks may be a problem since they use different types of addressing and are implemented with separate directories.

Michael Kaminski, manager of computer-integrated manufacturing and networking technology at General Motors Corp. in Detroit, also has some reservations. There are, he says, unresolved technical issues in interfacing WAN technologies, such as ISDN, to OSI. For example, at OSI Layer 3 (Network layer), most LANs support a "connectionless mode network service," which relies on Layer 4 (Transport layer) to make sure that data packets arrive at their destinations in order. On the other hand, WANs, including ISDN networks, are usually connection-oriented at Layer 3, meaning the Layer 3 protocol itself ensures that everything is received correctly and in order at the other end.

These problems are not insurmountable. Kaminski says systems may be forced to support both connection-oriented and connectionless protocols at OSI Layer 3 to interface with ISDN.

At OSI Layer 4, there are similar problems. There are several "classes" of transport at this level. Most OSI LANs support Class 4 transport, while ISDN WANs support Class 0 transport. Class 4 is more robust than Class 0 and does a great deal of checking for errors, whereas Class 0 does not.

OSI suppliers that require Class 4 transport will find that ISDN suppliers generally do not provide it. Thus, Kaminski says, LANs may have to support both Class 0 and Class 4 in order to talk to ISDN.

Also, Kaminski there is "some potential for overlap" between the OSI and ISDN services, and if ISDN and OSI suppliers end up competing with one another, competitive considerations could lead to a lack of cooperation on the technical front.

For instance, both ISDN and OSI could provide terminal services to the desktop but with differing approaches. ISDN suppliers would likely use a switch and provide a 64K bit/sec. connection, whereas the OSI solution would involve direct LAN attachment at megabit rates.

Such problems are not unresolvable. But how much motivation do vendors and users have to overcome them?

GM would certainly like to see ISDN interfaces that support OSI LANs easily and efficiently, Kaminski says. But wanting and getting are not the same thing. "Sometimes, we want certain things, but vendors do just the opposite. Sure, suppliers would like to see standards fall into place. But they're also commercially motivated. Sometimes, standards are secondary as far as they're concerned," he says.

"WE DO not have enough users who understand ISDN . . . Things are going abysmally slow."

MICHAEL KAMINSKI
GM

Dan Lynch, president of Advanced Computing Environments in Palo Alto, Calif., an educational firm specializing in interoperability, also questions whether ISDN holds enough value for information systems-oriented users to get involved in combining the use of ISDN and OSI. "ISDN draws a giant yawn with data people who are getting into 100M bit/ sec. systems such as FDDI," Lynch says. "A 64K bit/sec. circuit is fine for some functions, but it's a joke for others. I think they should be designing for T1 speeds" [1.5M to 2M bit/sec.].

By the time ISDN is actually fielded, he adds, the attitude of many OSI users may be, who cares?

Mike Albers, director of product planning at Fujitsu Business Communications Systems in Tempe, Ariz., also expresses some doubts about the data-handling appeal of ISDN. In North America, Albers says, "the phone companies are on the ISDN bandwagon and are busy spending

Continued on page 97

Hurwicz is president of the MTI Group, a communications consulting firm in Eastsound, Wash.

"Scuba tanks are all alike. Buy the cheapest one you can find."

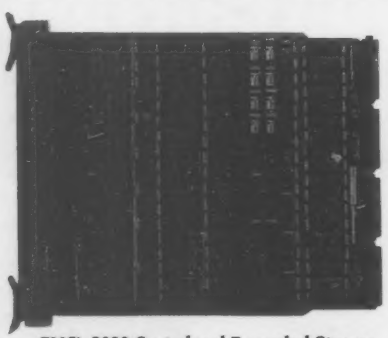
Not all floppy disks are alike. If you can't take chances with your data, don't take chances with anything less than a Dysan 100. We test 100% of our disks and certify 100% to be 100% error free over 100% of the disk surface.

The Dysan 100. It's not just a name. It's a measure of superiority.

Dysan® 100
100% Better

WHEN 3090 USERS WANT A MORE POWERFUL COMPUTER, THEY CALL A COMPANY THAT DOESN'T MAKE COMPUTERS.

WHAT'S GOTTEN INTO THEM?



EMC's 3090 Central and Expanded Storage.

EMC Corporation makes more powerful computer systems — even though we don't make computer systems at all. Instead, EMC turns the processing potential of existing CPU's into measurable gains in system throughput, people productivity and corporate profits. Which is exactly why more than 75% of the Fortune 500 have not only called our number — they've installed our products.

What kind of products? Products like EMC's 3090 central and expanded storage, which maximize utilization of system resources... which offer more configuration choices to match your applications more exactly... and which are comprehensively supported by EMC's worldwide sales and service organization.

EMC specializes in storage architecture — in moving data more rapidly, reliably and cost-effectively from where it's stored to where it's needed. That focus has made us an integral part of more than 1,500 IBM mainframe sites. And it has made our 3090 upgrades the right choice for companies that want to get a more powerful computer — without getting a new one.

For more information, call 1-800-222-EMC2 (MA residents call 1-508-435-1000) Ext. L948.

In Canada, call 1-800-543-4782

*3090 and IBM are registered trademarks of International Business Machines.

EMC²

The System Enhancement Company.

This highway still under construction

BY JEFFREY N. FRITZ

For many IS directors, the true potential of ISDN lies in the promise of national connectivity. Digital 64K bit/sec. data service has many advantages, even within the same telephone exchange, but these pale by comparison with the prospect of extending ISDN connectivity nationally.

Cross-country ISDN service would mean, for example, that a user on a business trip to San Francisco could access an IBM 3270 controller at his home office in Atlanta by placing a call over an ISDN 64K bit/sec. B channel. After finishing that session, the user could then connect to a regional mainframe in Pittsburgh, all with the same 64K bit/sec. digital connectivity. Likewise, the personal computer laptop user could have 38.4K bit/sec. dial access to his office file server hundreds or even thousands of miles away.

Three national carriers — AT&T, MCI Communications Corp. and U.S. Sprint Communications Co. — have recently announced long-distance ISDN services. But it is probably premature for data users to start dreaming of the functionality described above.

MCI and Sprint have expressed a commitment to providing data services to customers sometime in 1990. However, according to Mark Kramer, senior account executive at AT&T's business marketing division, data is not a high priority for AT&T's long-distance ISDN services.

Kramer says AT&T's ISDN network was designed primarily to support voice applications, and he doubts that ISDN data services are of major interest to users. "In time, data applications will develop," he says, "but right now, there simply isn't much call for them. ISDN data services could be useful to the salesperson on the road, who calls the home office with an order or a report. However, due to speed limitations, ISDN is not well suited for heavy data transfers from site to site."

AT&T is the only carrier with long-distance ISDN services in operation; it provides 35 customers with ISDN long-distance services. According to Daisy Ottman, a company spokeswoman, most of the customers are telemarketing organizations primarily interested in the service because of its flexible channel access.

Sprint plans to offer its service during the first quarter of 1990, and MCI says it plans to roll out service during the first half of the year.

It's like ISDN (really)

It is worth noting that both MCI and Sprint use the term "ISDN-like" to describe their initial implementation of planned services. As is true with the description "PC-compatible," the meaning behind the label is open to wide interpretation. Using the technical description of ISDN as providing circuit-switched (dial-up) and packet service to the user, none of the carriers can provide comprehensive end-to-end ISDN connectivity. There is simply no carrier support for D or B channel packet. (D channel packet allows users to have PC-to-PC asynchronous communications at speeds up to 9.6K bit/sec. B channel packet provides synchronous or asynchronous data support at speeds up to 64K bit/sec.) B channel circuit-switched data calls are supported only in a very narrow sense.

For now, "ISDN-like" generally implies a point-to-point digital channel and little more. Such services are roughly equivalent to a slice of a dedicated T1 running at either 56K or 64K bit/sec.

Just how "national" long-distance ISDN services can be is governed in part by the number of points of presence (POP) that a carrier supports. A POP is the point of contact between a central office or customer premises and a carrier's switch location.

MCI has 245 POP locations that cover the local access and transport areas (LATA) in the continental U.S. LATAs are regional calling areas that were carved out in the Bell System divestiture. When a call crosses from one LATA to another, it must be handed off to one of the carriers, even if the other LATA is in the same operating company's jurisdiction.

Sprint claims 286 POPs. With those numbers, Sprint and MCI will be able to provide access to ISDN services in most cities. By contrast, AT&T's ISDN long-distance services are limited to major population centers. Ottman says AT&T's plans call for a total of 73 POPs by the end of 1989 and 110 by the end of 1990.

> FOR NATIONAL ISDN to become feasible, all central office switches must be outfitted with SS7. Like most new protocols, there are differences among the versions of SS7 used by the carriers and the operating companies, and they need to be smoothed out.

A much larger obstacle for any carrier that aspires to provide nationwide ISDN service is the absence of coherent support for a critical protocol.

Long-distance digital services at 56K bit/sec., 1.5M bit/sec. and DS-3 rates have been available for some time. The difference with ISDN is that call connections are handled over the D channel. This is called "out-of-band" signaling and leaves the entire 64K bit/sec. B channel bandwidth at the disposal of the user.

The key to out-of-band signaling is a protocol called Signaling System 7 (SS7). For national ISDN to become truly feasible, all central office switches must be outfitted with the SS7 protocol. This may prove to be a formidable obstacle because most central offices do not yet have any IDSN capability; even among those that do, not all are slated for an SS7 upgrade. Furthermore, like most new protocols, there are differences among the versions of SS7 used by the three carriers and the operating companies, and they need to be smoothed out.

This situation is a source of concern for all three carriers. Mike Torbert, a technical consultant at MCI, says that "without a defined and accepted SS7 standard, full ISDN service cannot be offered by any carrier." Sprint also points to the lack of SS7 standards as the main block to providing dial-up ISDN access.

George Porta, senior network planner at Sprint, says his company uses a form of SS7 to establish its own data network access paths. Porta says it would be conceivable to provide limited ISDN dial access, provided both POPs were served by switches equipped with compatible SS7 protocols. This is possible, however, only if there is central office support for consistent ISDN protocols on both sides of the link. As mentioned before, the number of central offices equipped to interface in such a manner is extremely limited.

Eventually, Sprint hopes to deal with different SS7 implementations by

Continued on page 97

Fritz is a data communications analyst at West Virginia University in Morgantown, W. Va.

Information, please

Most users who call long-distance carriers are interested in voice applications. So far, that is where the efforts of AT&T, MCI and U.S. Sprint have been focused, including the way they train their customer service representatives. When it comes to data services, many agents are ill-equipped to answer users' questions.

A series of trial calls to carriers' 800 numbers to ask questions about their data services set off a ripple of stammering and throat clearing on the agents' part. In some instances, return calls from specialists were promised but never came. On other occasions, the inquiries were simply deflected with a recommendation that questions be referred to an authorized account executive. On average, it took two or three calls to reach a person who could answer questions.

Clearly, if the carriers are serious about long-distance data services, they need to prepare their customer service agents to handle inquiries from data users. This does not imply that agents must know all the ins and outs of data services. But they should be familiar with the terms "digital" and "data" and be able to provide a straightforward connection to a specialist who can assist the user.

JEFFREY N. FRITZ

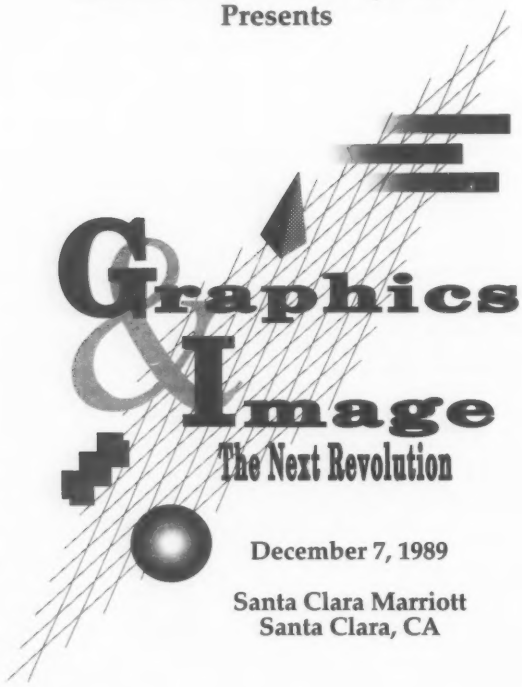
"A parachute's a parachute. Here's one that will save you big money."

A disk is a disk. Unless it's a Dysan 100. For your vital data, don't settle for anything less. We test 100% of our disks and certify 100% to be 100% error free over 100% of the disk surface.

The Dysan 100. It's not just a name. It's a measure of superiority.

Dysan® 100
100% Better

International Data Corporation
Presents



December 7, 1989

Santa Clara Marriott
Santa Clara, CA

Attend **IDC's Graphics & Image: The Next Revolution** for a bottom-line oriented analysis of the products and strategies that will drive the use of image and graphics in the applications of the '90s. IDC's technology experts will answer questions of how to manage the technologies/products, when to implement them, and who has the steak versus who has the sizzle. The primary focus of the sessions will be oriented toward customers and their issues in this new field.

THE PROGRAM

Graphics & Image -- An Information Revolution
Aaron C. Goldberg,Vice President, Workstation Research, IDC

PC Hardware and Applications for Graphics
Joan-Carol Brigham, Program Director, PC Graphics and Expansion Products, IDC

The Role of Graphic User Interfaces
Nancy McSharry, Program Manager, PC Software, IDC

Image and the Office System
Ann Palermo, Program Director, Integrated Office Systems, IDC

The Role of the Macintosh
Abigail Christopher, Program Manager, Macintosh Market, IDC

Low End Displays
Eileen O'Brien, Program Manager, Terminals, IDC

Image Storage
Jay Bretzman, Senior Analyst, Storage, IDC

Outlook for Image
Scott McCready, Program Director, Image Systems, IDC

International Data Corporation
5 Speen Street
Framingham, MA 01701

YOU WILL LEARN

- How far along your colleagues are in adopting and using graphics hardware and software products.
- How soon, and why, they plan to upgrade to higher resolution and/or color.
- How far presentation graphics software and desktop publishing software have penetrated the PC user community.
- Where image applications are most effective.
- Key supplier's product strategies.
- Cost-saving alternatives to a PC on every desk.
- Which graphic and image applications provide the best return on investment.

WHO WILL ATTEND

Office Automation Managers, Information Center Managers, Application Development staff, and those responsible for their organization's graphic & image strategies.

Vendors interested in thier clients' wants and needs, and their competition's answers.

REGISTER EARLY!

Attendance is limited and this session is expected to fill quickly. To avoid disappointment, reserve your place today. Contact Kathy Collins at **(800) 343-4952**, extension 4258. In Massachusetts call (508) 935-4258. Registration Fee - $595.

OSI and ISDN

FROM PAGE 93

billions implementing it. We don't see that fever from MIS people."

Some corporate supporters of ISDN said they believe it will simply take time for the market to catch up with the potential of ISDN-OSI pairing.

"At the moment," Kaminski says, "we don't have enough users who understand ISDN. If they did, they would start yelling for real progress. Things are going abysmally slow."

The real problem, according to W. Edward Hodgson, manager of computing and communications at Westinghouse Elevator Co. in Morristown, N.J., and former chairman of the North American ISDN Users Forum, is that people are too busy struggling with what they need to do today to worry about the next step. Drawing from his own situation, Hodgson notes that he currently has Hewlett-Packard

"WE WANT to make sure we go the right way in interfacing LANs and WANs, but we're still not sure which way is right."

W. EDWARD HODGSON
WESTINGHOUSE ELEVATOR

Co., Data General Corp. and Digital Equipment Corp. computers on the same Ethernet. None of them can currently talk to one another even over the same LAN, Hodgson says, making it premature to worry about doing it over ISDN.

Because of that, Hodgson says, clear solutions for connecting OSI and ISDN are not emerging quickly. "We want to make sure we go the right way in interfacing LANs and WANs," he says, "but we're still not sure which way is right."

Although the OSI-ISDN partnership has a lot to recommend it, the two standards may not settle into a real working relationship for some time. "It will be a long ramp-up time," Lynch says, "unless an application comes along that gathers critical mass." •

Highway

FROM PAGE 95

offering Gateway Signaling Transfer Points to provide SS7 interoperability. According to project manager Merrill W. Davis, beta testing of the service has begun.

In the interim, MCI plans to offer a digital gateway service to connect data users on a T1 line. Switched 56K bit/sec. service is slated for the fourth quarter of this year. MCI's migration toward full ISDN is planned over several phases.

Phase 1, scheduled to begin in the first half of 1990, will allow national T1 backbones, which can be connected in a loop configuration to multiple locations.

Phase 2 will provide bandwidth on demand and reroute T1 links for disaster recovery or short peak demands.

Phase 3 provides extra capabilities to the MCI data package, such as time-scheduled channel access and switched services.

When you put all of this together, it becomes clear that, at least in the U.S., full ISDN long-distance connectivity may not be available soon. In some countries, such as France, interconnecting networks were established before ISDN service was offered to customers.

Here, ISDN implementation has developed in unconnected islands, and that pattern is likely to persist for some time, despite the potential that total ISDN connectivity holds for significantly enhanced data communications. •

Microcom Presents The High Performance Modem Buyer's Guide

The Microcom High Performance Modem Buyer's Guide NEW

Microcom gives you the most complete selection of high performance modems available from any vendor. Microcom is also the company that invented MNP® - Microcom Networking Protocol - the industry standard for protocol modems.

If you need full V.32 compatibility, the QX/3296c has it. Along with a throughput of 19,200 bps and UNIX protocol support.

We also offer the world's fastest modem: the QX/V.32c. At over 30,000 bps, it's the modem to buy when speed is crucial. Our new QX/2400t is fast, features new MNP Class 10 and is very economical at $699.

The bottom line? We can give you the right modem at the right price for any application. All with powerful remote access for configuring and troubleshooting distant sites, plus 100% error-free transmission. We set the standard for the industry. And now we're setting standards for price and performance too.

	QX/V.32c World's Fastest	QX/3296c UNIX Support	QX/2400t Most Economical
Maximum throughput	38,400 bps	19,200 bps	19,200 bps
Typical throughput	30,000 bps	17,000 bps	12,000 bps
MNP Class	9	5	10
Modulation standards	CCITT V.32, V.22bis, Bell 212A, 103	CCITT V.32, V.22bis Bell 212A, 103	V.22bis Bell 212A, 103
100% error free	Yes	Yes	Yes
UUCP Protocol Support (UNIX)	No	Yes	No
Kermit Protocol Support	No	Yes	No
Remote Access	Yes	Yes	Yes
MNP Password Connection Security	No	Yes	Yes
Price	$1,599	$1,199	$699

The Modem Buyer's Guide

* FREE GUIDE

No company is better suited to give you the facts on modems than Microcom — the inventor of the industry standard. Get your free copy of "The Modem Buyer's Guide". Call toll free 1-800-822-8224 today.

Microcom

Workstation Connectivity Worldwide

500 River Ridge Drive, Norwood, MA 02062 617-551-1000 Telex 710-336-7802 MICROCOM NWD
Worldwide Distribution—International FAX: 617-551-1007 USA FAX: 617-551-1006
Toll-free 800-822-8224

MNP is a registered trademark of Microcom Systems, Inc. QX/V.32c, QX/3296c, and QX/2400t are trademarks of Microcom Systems, Inc.
• Microcom, Inc. All rights reserved.

Manage 100MBs of data. On a 10MB PC.

With the Cipher 9000 Series 9-track tape subsystem and Tarsus software you can work with over 100 megabytes of mainframe data on a 10 megabyte PC. Quickly. Easily. Inexpensively. And without tying up your mainframes.

The Cipher 9000 Series is a 1/2" reel-to-reel tape system that reads IBM, ICL, UNISYS, DEC and NCR compatible formats. It works with all IBM compatible 286 and 386 PC ATs and XTs.

Working with Tarsus software, the 9000 Series automatically translates data from the tape to the PC. At a speed of five megabytes a minute. Which is 100 times faster than the conventional communication lines on most networks.

Thanks to its menu driven interface and fourth generation query language, Tarsus can be mastered in a matter of hours without advanced technological expertise.

By utilizing prompts, pop-up windows and on-line help, Tarsus guides users through the tape interrogation process. Allowing them to gather information, produce exception reports and download into databases, word processors or statistical packages such as SAS.

Tarsus also provides a direct import to other DOS applications like Lotus 1-2-3 and dBASE III.

And unlike on-line mainframe transactions, you always have control over what information is manipulated and by whom.

Find out more about the Cipher 9000 Series and Tarsus software today. Call 1-800-4Cipher and we'll send you a free Tarsus demo diskette along with more information on the Cipher 9000 Series.

It's the best way to get more out of your PCs.

And your mainframe.

cipher

© 1989 Cipher Data Products, Inc.

Becoming an IS mentor

Learning to be a skilled adviser can pay off for your staff, career and firm

BY KATE NASSER

Promoting your career involves more than just continuing education in management programs and updating your resume. Information systems managers have an opportunity to advance themselves and keep their organizations competitive by helping solve the expected technical-labor shortage of the 1990s. The key: becoming a mentor.

The idea of mentors — experienced employees who act as a trusted guide or coach — has become popular in many business disciplines. But so far the idea has not caught on in IS. The time is now ripe for that to change.

The reason is simple: As an IS professional, your value is based on providing the corporation with business advantages and meeting corporate goals through the appropriate implementation of technology. To do this, you have to attract, develop and retain competent and creative IS professionals.

Why is mentoring critical now? The first reason is that mentoring makes sense. A recent college graduate with an IS degree still has much to learn about how the corporation operates, its philosophy and products and, of course, how its computer systems work. Existing IS staff have already gone through at least part of the process with the new employee. You can guide him further.

Second, mentoring keeps technical talent within your firm — a competitive advantage.

Nasser is president of Computer Automation Specialists, Inc., a management consulting firm based in Piscataway, N.J.

If a departing employee is involved with a technology being used in long-term strategic projects, staff turnover could be the kiss of death. Besides losing product life-cycle knowledge (different from information, which can be documented), introducing a replacement worker also means having to re-establish rapport.

Contrarily, retaining knowledgeable employees who sing your praises as a dynamic manager can bring positive results for projects and for your career.

The third reason that IS mentors are important now is that the predicted shortage of technical personnel will shift the power of choice from the company to the employee (potential or existing) over the next few years. When this occurs, competitive salaries alone will not be enough to attract or keep employees. Salary wars could wage among all companies, negating the attractiveness of any dollar figure. Perquisites such as child care and elderly care are attractive incentives for some two-income families, but they lose their appeal as an incentive to stay as soon as one spouse has these benefits.

A far stronger approach is to retain knowledgeable, creative professionals by fostering their long-term professional growth.

Day-to-day challenges and opportunities for personal and professional growth will add extra staying power that salaries and perquisites cannot. It is time for companies to form "career partnerships" with their employees, and IS managers can play a vital role by introducing such partnerships in their own departments.

The final reason to consider mentoring now is that you can't expect results overnight. An IS manager cannot announce a mentoring program today and get results tomorrow; trust must be nurtured before staff members will open up.

ROBERT DeMICHIELL

Dual payoff

Mentoring is not a one-way street on which you provide the benefits of your experience to someone less expert and get nothing in return.

A mentor's advice and feedback will help hone employee skills and make them more valuable to the company. It is a communication mechanism, which breeds more communication that can benefit everyone involved, yourself included.

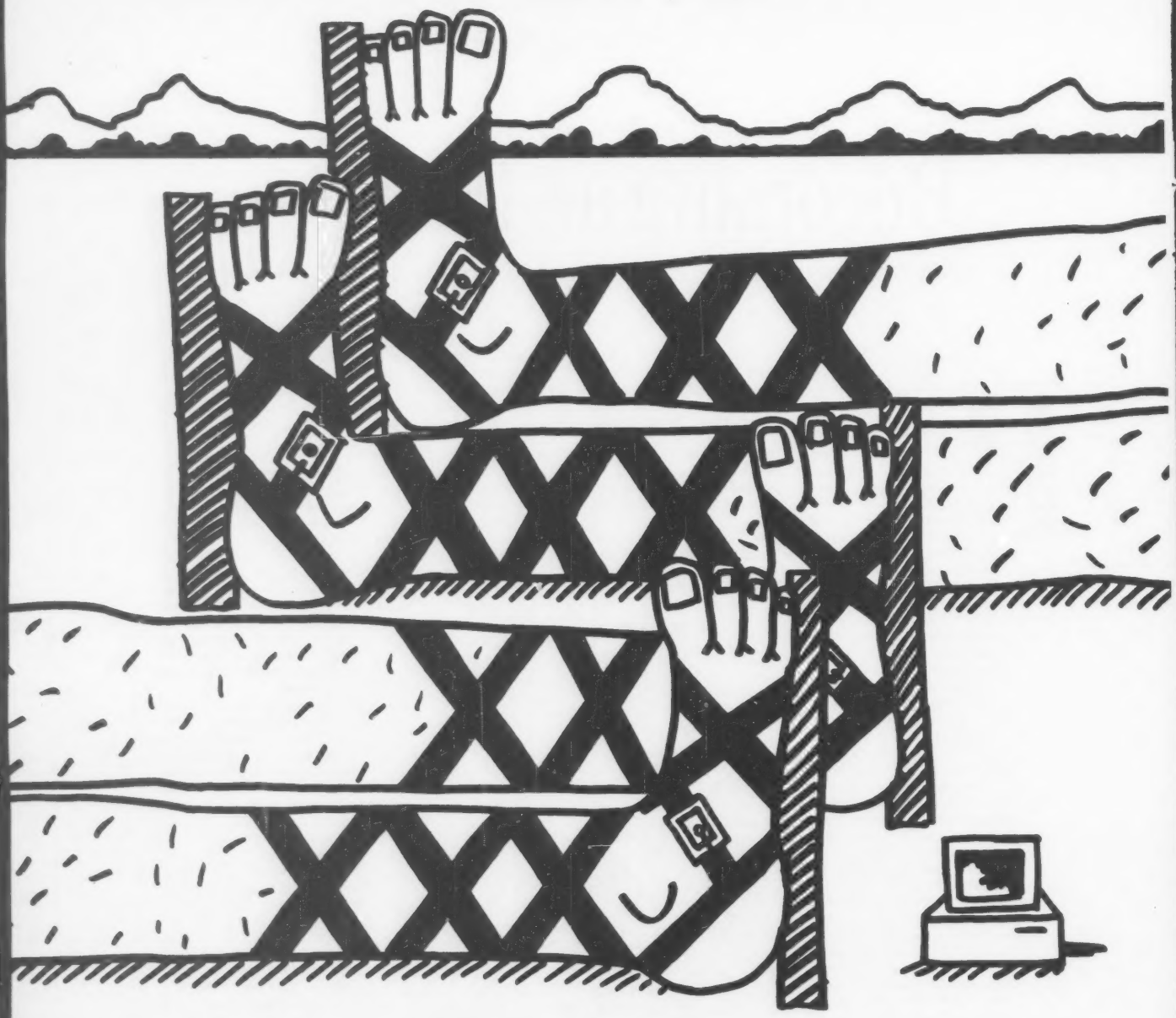
As a mentor, you will learn from your staff and discover a rich source of new ideas.

The interaction of human thoughts — one idea triggering another — is an exciting process. As you give a suggestion or an idea to a staff member, his response may suggest a view of the project or strategy that you

• A tool to keep technical talent on board

• If they look good, you look good

• Start small, but start now



How one AT&T Networked Computer managed to topple 2 giants.

InfoWorld, a leading PC journal, just rated AT&T's 6386/25 WGS superior to the IBM® PS/2® Model 70-A21 and Compaq® Deskpro 386/25 in an overall test of performance, ease of use, serviceability, and value, among other things.

While our primary mission is to provide you the best Networked Computing solutions in the world, we never shrink from a confrontation with the PC giants.

Thanks, *InfoWorld*, for spreading the good news.

For a free reprint of *InfoWorld*'s report card, call 1-800-247-1212, extension 296. For a demonstration, contact your AT&T Authorized Reseller or AT&T Account Executive.

AT&T
Computer Systems

© 1989 AT&T. IBM and PS/2 are registered trademarks of International Business Machines Corp. Compaq is a registered trademark of Compaq Computer Corp.

never considered. In turn, the process will spread to staff members as trust builds and communication flows.

The following are some effective coaching methods:

• **Develop an open, honest relationship with your staff.** One way to start establishing a mentor relationship is to give staff members more positive feedback and display concern for their interests and problems. People in your group may be able to define their expectations, making it easier for you to determine how much assistance they will accept.

Staff members will not share their long-term personal and professional goals with you unless they feel sure that doing so will not jeopardize their immediate well-being with the company. One way to build trust is to share your own goals.

Another way to build trust is to demonstrate interest in employees' lives. If an employee is having a personal problem, you should not become a therapist. But you can listen and ask if they are getting help. If not, suggest that they find an appropriate source of help (clergy, therapist, relative or good friend).

During difficult times, it is important to be flexible and communicate to the employee that you will need extra effort from them at a later date.

Most important, do not force openness; it takes time for people to feel comfortable. If certain staff members do not open up to your mentoring efforts, resist branding them as less valuable.

Don't keep hammering on the concept of sharing personal goals — their initial lack of response indicates that you may need to determine what motivates them before they will open up. If their protective attitude inhibits team effectiveness, focus on the team aspect when you speak to them.

• **Create opportunities.** You can maximize the value and quality of service employees can provide to the company through continued professional growth. If you don't tap an employee's potential, he will become frustrated and bored.

To combat this, such workers should be allowed to work on projects they are not usually assigned to. If a task force is forming, you might suggest a staff member who is usually not picked first. Tell that person they represent your group. Let them know what your expections are.

You also can work with business-unit managers to create a job rotation program, which helps employees learn the bigger company picture, thereby making them more valuable to your group and the company. Conversely, employees of other business units should rotate into IS to gain an understanding about what current technology can and cannot do.

Assume a global view of career development. Career windows need to be open throughout the company, not just within IS. This will attract those from other departments who are seeking a future in systems and will provide your staff with additional opportunities throughout the company.

• **Give your staff visibility.** Let management in other departments and at upper levels see the talent you have developed and retained in the company. Do not be possessive. Talented staff will resent any moves you make to hold them back from professional growth. If they move to other departments anyway, you may have an adversary to deal with in the future.

Consider an accomplished technical expert who has just found the cause of last night's accounting-system crash and has just solved the problem. You are going to a status meeting on the problem. Why not take the expert to the meeting and have him describe the solution in person? Inform her that she must use understandable language and needs to avoid unecessary "techno-talk."

Visibility is essential at review time, but it is also critical to employees as a measure of their value.

• **Differentiate between career development and the performance reviews/promotional ladder cycle.** Promotions are only a small part of career development; the emphasis should be on growth — horizontal and vertical.

A career is a set of personal and professional goals and activities undertaken to meet those goals; it is much larger than specific job functions or responsibilities.

You and your staff should have career plans that focus on relevant, desirable tasks and functions, regardless of whether they are applicable to your current employment. You might want to have employees share their career goals, so that you can suggest appropriate avenues — courses, projects and contacts — to those goals.

• **Hone the managerial and technical skills of each staff member.** Let technical staffers implement the business strategies you develop. In a group, the different approaches of the technical, business and people-oriented staff members will become visible. Each individual will absorb some of the orientation of the others. This is low-cost training done in a productive setting.

• **Look beyond your own backyard.** You cannot be an effective mentor at a departmental level only; a change in company outlook is essential. Change must start in your department, for you are closest to the individual who needs coaching. Retaining more productive employees will speak loudly to upper management and will help make the case for an active companywide career-mentoring policy.

• **Lobby to create dual promotional ladders to complement your advisement efforts.** Technical specialists often leave companies because the organizational structure places a lower value on them than other, more "glamorous" jobs. Less recognized, they turn to salary increases as reinforcement of value. Unfortunately, these salary increases often take staffers outside of the company.

To avoid losing good people, talk to your director about a dual promotional ladder. Follow up by speaking with your new contacts at human resources about the importance of providing such options.

A good tactic is to keep track of the number of IS staffers (yours and other managers') who leave because of lack of promotion opportunities. If your director is not interested, call on your colleagues in IS and talk about it over lunch or after a game of tennis. Perhaps their director will help you take your case upward.

Another tactic is to talk with IS managers from other organizations as you attend conferences and determine what organizational structures are effective. Remember, you are on a fact-finding expedition to create the strongest case possible to create promotional opportunities for the IS staff at your company.

The alternative to dual promotional ladders is a flat organizational structure, in which an employee's career growth is more horizontal than vertical. The

Continued on page 103

Mentor, lead thyself

It is difficult to guide others when your own goals are unclear — it's important to understand your own career ambitions first. A good way to do this is to write out personal and professional goals and draft an action plan.

Start by asking yourself if you want to be motivated by power or your own achievements. If it's the latter, develop a list of career options that don't focus on management. Speak to a career counselor, who can help you determine the best alternatives. If you are quantitatively oriented, the counselor can administer tests that measure your strongest traits and interests. Above all, be honest with yourself and your counselor about what makes you really happy.

On the other hand, if you like credit for being a team leader, define how big you want your team to be. This will help identify those whom you should advise . You may find yourself with a larger sphere of influence than you had earlier imagined.

For example, an IS director at a Fortune 1,000 company garnered the respect not only of his managers but of the three other IS directors as well. He did this by working closely with the other directors instead of competing against them. He often gave his peers advice and pitched their proposals along with his. He was, in effect, playing mentor to a large group while promoting his own career.

Knowing where you want to go benefits both your employees and you.

DOS, OS, or CICS Frustration?

BIM gets it out of your system.

BIM presents a line of proven programs that maximize your system's capabilities, saving you time, labor and expense. These program products help get the most out of your system and people.

BIM-VIO — DOS/VSE Virtual Disk Drive. Moves the Standard Label Area directly into memory and allows for other heavily used non-permanent files to be moved into memory as well. NEW
BIM-PACK — Automatically compresses selected VSAM files transparent to applications and end users under DOS. NEW
BIMWNDOW — Multiple terminal sessions concurrently at CRT under DOS or OS VTAM.
BIM-EDIT/DOS — The most powerful, flexible full screen editor available for DOS/VSE.
BIM-EDIT/MVS — All of the features of our popular DOS editor and does not require the overhead of TSO. Can be accessed directly from VTAM or from CICS or other terminal subsystems. NEW
BIMSPOOL — Prints output in POWER/VSE spooling queue on local or remote 3270 terminal printers. (Received ICP Million Dollar Award 1982).
BIMSPLSR — Optional laser printer support for BIMSPOOL.
BIMSPOON — On-Line to Batch Print Spooling. Prints data passed from CICS application programs into the POWER spooling queue.
BIMSPLIT — May be used separately or with BIMSPOOL to print parts of an existing job to terminal printers at separate sites.
BIM-PDQ — POWER Dynamic Queuing performance enhancement. Eliminates 85% of the I/O to heavily used POWER queue.
BIM-PADS — Automatically alters or deletes DOS POWER spooled job entries at preset intervals.
BIM-ODIS — Comprehensive problem analysis and display of operational CICS system. ODISTRAK is an optional historical reporting feature to be used with BIM-ODIS to generate reports relating to system usage. DOS and OS. NEW
BIM-BUFF — Significantly increases the performance of VSAM under DOS by dynamically managing VSAM buffers. NEW
BIMTEXT — Word processing, document composition system. Create formatted documents from free-form input. DOS and OS.
BIMSWAP — Switch local 3270 BTAM terminals between multiple CICS partitions without special hardware or additional ports.
BIMCMPRS — CICS 3270 data compression system. Reduces response time for remote terminals significantly. DOS and OS.
BIM-FMAP — CICS BMS on-line map generation and maintenance. DOS and OS.
BIMECHO — Copies one CRT's output to another or printer for problem determination and demonstration. DOS and OS.
BIMP3270 — Comprehensive CRT screen image print facility. Copy to terminal printers or spool queue for system printer. DOS and OS.
BIMSERV — On-line display of library directories and entries, VSAM Catalog entries, disk VTOC's, etc.
BIMCNSOL — Multiple/Remote System Console function for CICS. Display-only or full input/display versions available.
BIMMONTR — DOS/VSE System Status, Performance Measurement, and POWER Queue display.
BIMSUBMT — On-line Job Edit and Submission facility.

BIM programs are cost-efficient, some less than $800, average $2500. You can save even more with our group package offerings. Products are available on permanent, annual, or monthly licenses, and shipped on a 30-day free trial basis. Product documentation is available on request.

BIM also performs systems programming consulting, with consultants based in Minneapolis and Washington, D.C. Computer time services are also available on our 4331-2 system, on-site or remote.

BIM
BI MOYLE ASSOCIATES, INC.
5788 Lincoln Drive
Minneapolis, MN 55436
612-933-2885
Telex 297 893 (BIM UR)
Member Independent Computer Consultants Assn.

NETWORK EFFICIENCY TEST

1. Has your minicomputer become the most expensive word processing and E-mail system on earth?

2. Do you need to manage more types of cabling than the phone company?

3. Are networking problems causing your PC LAN to work less hours than you?

4. Is your application development backlog over 6 months? Over 1 year? Over your head?

5. Are you feeling insecure about your PC LAN security?

6. Is the performance of your network going down as the number of users goes up?

7. Do your computing vendors spend more time pointing fingers at each other than pinpointing problems?

8. Is it impossible to expand your computer system the same way you add users. . .incrementally?

9. Is Engineering having trouble communicating with Marketing? Is Building 2 difficult to reach from Building 6? Is the second floor not talking to the seventh?

10. Are your users wasting time trying to communicate with uncommunicative hosts?

11. Is your computing system unable to run both DOS and OS/2 programs? How about the new SQL database applications?

IS YOUR NETWORK IN NEED OF WASTE MANAGEMENT?

If you answered yes to any of these eleven questions, your computer network is wasting two things.

Time and money.

Fortunately, there's one company that specializes in turning hazardous waste into manageable networks. 3Com.

3Com's 3+Open™ Client-Server System offers you the security and manageability of a minicomputer. As well as the ease of use and broad application support of a PC LAN. Think about it. The best of both worlds with one small investment.

This computing platform consists of our file server, diskless workstations, and 3+Open LAN Manager network operating system. It allows you to add power and users as you need them. And it runs DOS, OS/2,™ client-server and even your electronic mail applications. Cost-effectively and efficiently.

With 3Com® bridges and repeaters, you can extend the reach of your systems from workgroup to worldwide. Over whatever type of cabling you've already installed. All the time, backed by our expert service and support organization.

If you'd like more information on these systems or any of our other 350 networking products, just call 1-800-NET-3Com, Dept. RF.

And let us put an end to all this senseless waste.

3Com

We network more types of systems to more types of systems.™

© 1989 3Com Corporation. 3Com, 3+Open and the 3Com logo are trademarks of 3Com Corporation. Operating System/2 is a trademark of International Business Machines Corporation.

Mentoring

CONTINUED FROM PAGE 101

bottom line is that the traditional one-ladder approach is outdated and ineffective. Determine what new method will work best for your company and lobby for it.

• **Develop a closer relationship with human resources.** Getting the right person into your department will make keeping him more desirable and feasible. Consider this a "prementoring" step that will make mentoring even more effective. Offer to assist in recruiting.

You can ask human resources to sponsor career-counseling seminars for managers in all departments. If human resources resists, coordinate sponsorship between departments and bring in outside consultants to offer programs.

You also can read human resources trade journals; ask your rep to circulate publications that feature career-management articles or get subscriptions to these journals yourself. Top human resources consultants write for these publications and offer career-management tips and problem-solving advice. Journals such as *Training*, *Personnel* and others are listed in *The Readers' Guide to Periodic Literature* under relevant topics such as "career motivation." An hour in your corporate, university or public library will give you a wealth of information.

• **Make contacts with other IS and business-unit managers.** A mentor without contacts is of little value. Some staff members may ultimately want careers in marketing or other areas; if you have helped them achieve their goals by making the right contacts, you will have a grateful ally for future team projects.

Networking with other IS and business-unit managers will give you more visibility and keep you in touch with other departments. After-hours company sports leagues (such as raquetball and bowling) as well as lunches and the few moments before business meetings begin are all good ways to make contacts. Always ask what's new in other departments and how things are going. Listen during meetings for projects that may require interdepartmental team effort.

Keeping abreast of corporate activities is key if you are going to provide the most up-to-date advice to your staff — and yourself — on potential opportunities.

• **Help your company establish a reputation for career commitment.** Speak about your new efforts at conferences attended by IS and non-IS professionals. You and your firm will benefit more from conferences if you participate.

You may also want to give your senior staff members an opportunity to speak. If the conference is dynamic and well attended, participate each year. The exposure will build a reputation that will attract experienced professionals — provided you do a good job in presentation.

It is important to use use professional development as a tool for meeting present and future goals. Stress the concept of the knowledge worker in promoting this interdepartmental career development.

Eastern influence

Japanese companies have gained competitive advantages for a number of reasons — one of which is strong cross-training in related company functions. Their communication is more effective than in many U.S. firms because everyone involved in mounting a challenge, solving a problem or bringing a product to market has an understanding of the issues.

Furthermore, all expert parties are brought into a project in each phase: inception, design, development and testing. The one-department, one-function concept is not efficient in a nonassembly-line environment. Sharing information in a purely sequential manner wastes time. The team approach, where each member concurrently addresses a piece of the puzzle, creates truly workable solutions to the challenges at hand. It also gives employees the bigger picture and a sense of working on the critical problems of the company. The visibility they gain is a further reward for creative work.

Ultimately, you need to promote the idea that people are a company's most valuable resource. This key message can be effectively communicated to your staff through mentoring. You can make pilot results visible to upper management — and win support for a companywide mentoring program.

As a good mentor, you will be known as a creative, dynamic manager who can retain talented professionals and meet key corporate goals through human resources management. And you will have increased your own value and promoted your career by mentoring the careers of your staff. •

Don't worry, be helpful

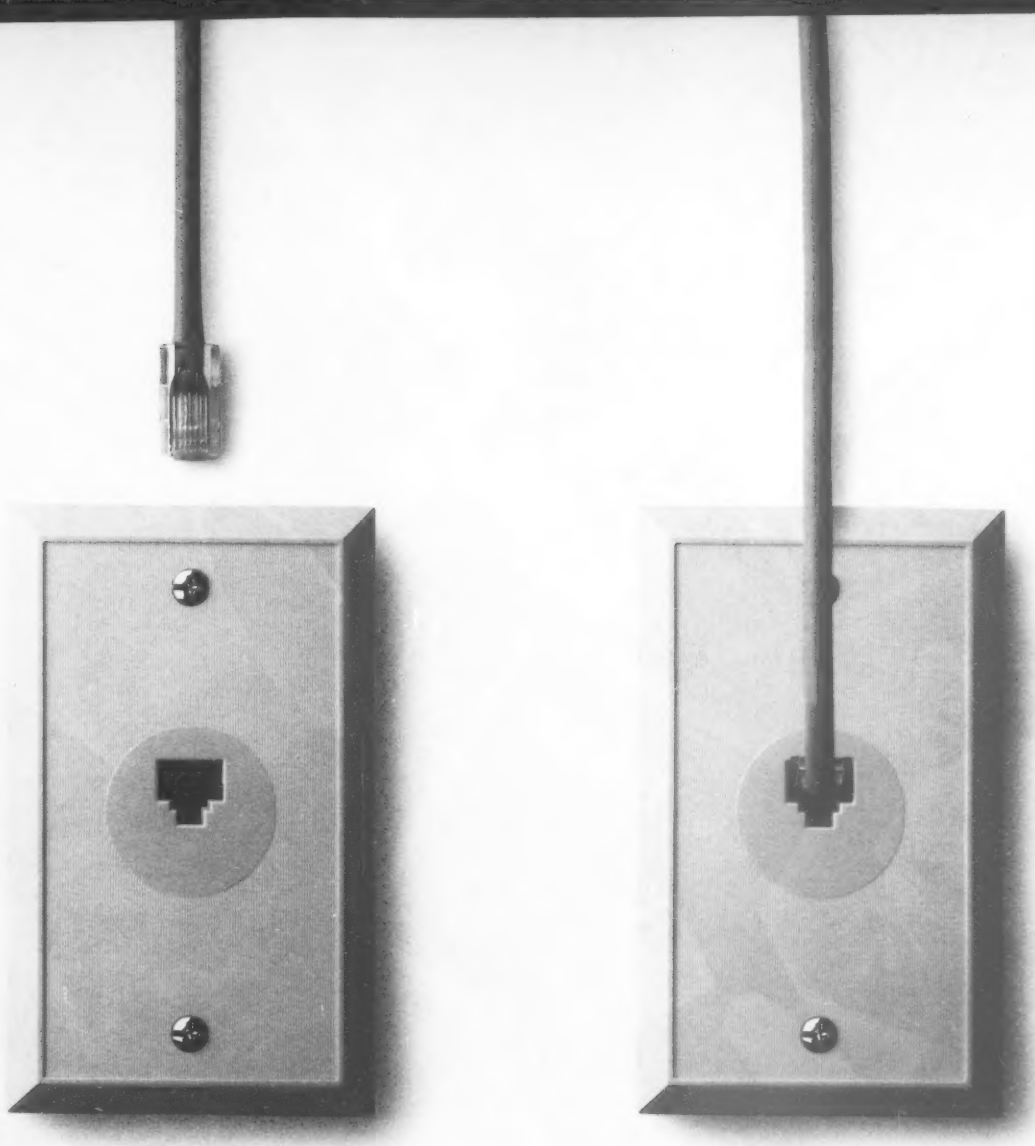
During the mentoring process, you may worry about employees surpassing you. If you are tempted to keep them captive in their current position, resist.

You do not really have the power to hold back your employees. If you try, some will find mentors outside of the department. If they move up the ladder with outside help, they may become adversaries.

Concentrate on being a good mentor. You can learn the employees' views and win their trust; they will want to work with you for as long as possible. Keep in mind that helping an employee advance also helps you. Remind yourself that as a manager, you need to consider power as your motivation. Mentoring gives you the power to motivate people and effect change.

This is hard to remember for many programmers-turned-managers, who are accustomed to being valued for their own achievements as technicians. Unfortunately, such people do not realize that managers are valued for the achievements of their groups. So, instead of trying to put the spotlight on themselves, they need to learn to highlight the achievements of their employees. (Note that this is different from taking credit for their work.) Smart managers taking this tack will bask in their group's reflection.

Helping an employee always helps you; if they look good, you look good.



The closer you get to ISDN, the better we look.

That's because when it comes to ISDN, Fujitsu Business Communication Systems has put it all on the line. With products like our Fujitsu F9600.™ It's a family of fully compatible voice/data systems that expands from 100 to 10,000 lines and was designed with ISDN in mind. It'll meet your telecommunication needs now, and when you're ready to take advantage of ISDN, you'll have a fully compatible system. We'll even show you today how to apply ISDN technology in your business. So when ISDN is ready to roll, you'll have all its benefits with a system customized to your needs. Naturally, the F9600 is backed by nationwide service, support, and training, even if it's part of a multi-vendor network. About what you'd expect from a company that's a part of Fujitsu Ltd. A $16 billion global computer and telecommunications leader who has not only been around for over 50 years, but is also a pioneer in ISDN technology. So call or write us at 3190 Miraloma Avenue, Anaheim, CA 92806. 1-800-654-0715. And let's take a closer look at the future.

FUJITSU

FUJITSU BUSINESS COMMUNICATION SYSTEMS

© 1989, Fujitsu Business Communication Systems. F9600 is a trademark of Fujitsu Business Communication Systems.

Our standards are the toughest part of our 3.5" diskette.

We've got you covered. The rigid plastic jacket of our 3.5" Micro Diskette is molded to our own specifications for unsurpassed protection. And our clipping level is 44% higher than industry standards. Call 800-343-4600 for the name of your nearest BASF supplier.

Depend on it.

BASF

Mentoring can be the best policy

BY JOSEPH MAGLITTA

While the practice of mentoring is just now reaching IS circles, it has been an informal policy at Unum Life Insurance Co. since the mid-1970s — long before the term became vogue.

Over the years, a "mentality of volunteerism" and the support of Unum management has spawned a mix of mentors, coaches and volunteer instructors among the 4,000 employees, according to Sue Redkey, who trains mentors at the Portland, Maine-based company, which specializes in long-term disability insurance. A self-described "cheerleader" for corporate-sanctioned volunteer programs, Redkey — officially a systems development support specialist — believes that encouraging volunteer participation works to an organization's advantage.

"If companies are going to keep good employees as the work force shrinks, they need to offer opportunities other than promotions," she says.

At Unum, mentors are selected by individual business groups. Mentors come in all ages, ranging from those "a couple of years out of college to people in their late 40s and 50s," Redkey says. "People who are picked see this as part of their own personal growth plan."

What kind of people make successful mentors? "People with good communication skills and patience," Redkey explains. The duration of training varies with the position. Some mentors participate in a 10-week mentor training program, which focuses on such areas as conflict resolution and face-to-face communication techniques.

"People need communication skills. It might be something simple like knowing that you don't run a meeting and go all morning without taking a break, because people need a chance to interact. For some, knowing this doesn't come naturally."

Between 30 and 40 people a year, a dozen at a time, participate in Redkey's mentor training programs. Besides "people skills," participants learn to develop training courses.

"People in the data center just love it," she says. "It's their chance to get out."

Among the enthusiastic volunteers is Paul Benson, an IBM MVS/XA systems programmer who became a volunteer shortly after starting with Unum in 1982.

Glass-nost

While much of his interaction involves answering technical questions about Cobol or JCL, Benson also sees volunteering as a way to break out of the isolation of a glassed-in data center and to break down "the long-standing bad blood that seems to exist everywhere between systems and applications programmers."

Another plus, he says, is that volunteering "helps counter the image that systems programmers are stuck up and snobby. Our message is we want to be there for you."

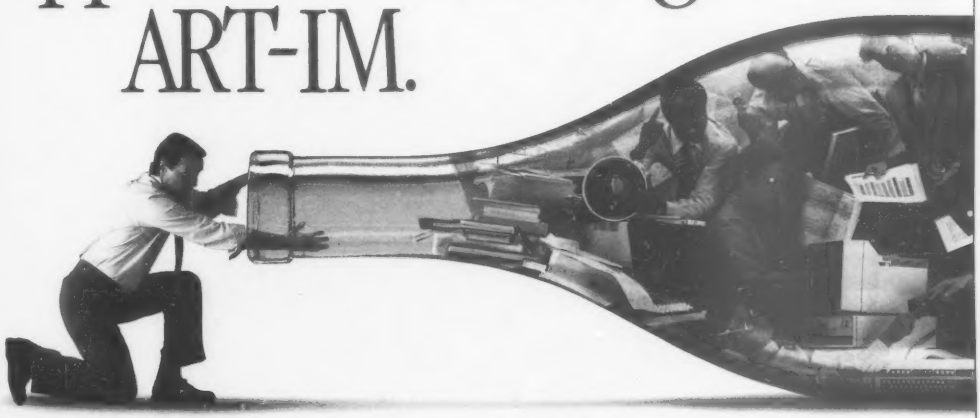
Benson and Redkey agree that management cooperation is key if mentoring and other volunteer programs are to succeed in a company.

"The corporation provides an environment in which this behavior is accepted and applauded," Benson says.

Over the last year or so Unum's volunteer programs have been transformed a bit, according to Redkey. Unum now contracts with Boston University for some of its training, and with fewer resources, employee volunteers in some cases now play roles as both mentors and tutors. "The emphasis is more on one-on-one training skills," she says.

But regardless of its form, programs can only succeed if they have companywide support, Redkey concludes. "If management has an attitude of 'Hey, we're all in this together. Let's make it work,' it's great. The idea does work, but it depends on the culture and the people. They have to believe that it will work. The culture has a lot to do with success." ●

Relieve your CICS and IMS application backlog with ART-IM.



If you're like most CICS or IMS shops, you're probably spending 80% of your time and expenses on maintaining existing programs. Which makes it virtually impossible to meet increasing user demands. As a result, you've got an enormous application backlog. Now, Inference can help you address it with ART-IM,™ the Automated Reasoning Tool for Information Management.™

ART-IM is a powerful tool for developing applications in MVS, CICS, IMS, MS-DOS and OS/2. Its impressive rule-based and object-oriented programming offer vast advances over procedural programs in solving everyday problems.

Dramatically reduce your maintenance expense.

Frequent changes in business policies and procedures can turn your software applications (e.g., payroll) into spaghetti code. Modifications become difficult and testing becomes time-consuming. Your applications cannot keep pace with your business.

With ART-IM, however, your business policies can be directly represented as software business rules — each independent of the other. For instance, you can represent one business rule with one ART-IM rule.

Unlike procedural programs, rules can be added, deleted and modified — independently of any other rules in the application. A change in policy maps directly to a change in the software statement that represents it.

Extend user functionality.

By capturing the knowledge and experience of your best decision makers, your ART-IM application becomes a reservoir for the company's expertise and its evolving policies and procedures. You can then make this invaluable information available on-line to your entire organization.

What's been the impact on end users? A new level of functionality never before available for making consistent and accurate decisions.

A long track record of successful customers.

Ten years of technology refinement has made Inference a leader in the industry. We've helped many companies successfully implement production expert system solutions. Our practical building block approach allows us to offer an extensive range of knowledge-based products and professional services, depending on your needs and resources.

Today, our customers are using ART-IM to cut maintenance efforts dramatically. In addition, many are reporting ten-fold improvements in development productivity.

So if your applications backlog has created an enormous bottleneck in your productivity, ART-IM can help you find your way out. For complete information, call Chris Dow at (213) 417-7997. Or write Inference Corp., 5300 W. Century Blvd., Los Angeles, CA 90045.

IBM Business Partner

Inference®

The Expert System Experts™

IBM is a registered trademark, and CICS, IMS, MVS, OS/2, are trademarks of International Business Machines Corp. MS-DOS is a registered trademark of Microsoft, Inc. ART-IM and the Automated Reasoning Tool for Information Management, are trademarks of Inference Corporation. © 1989, Inference Corporation.

Every 500 years or so, comes

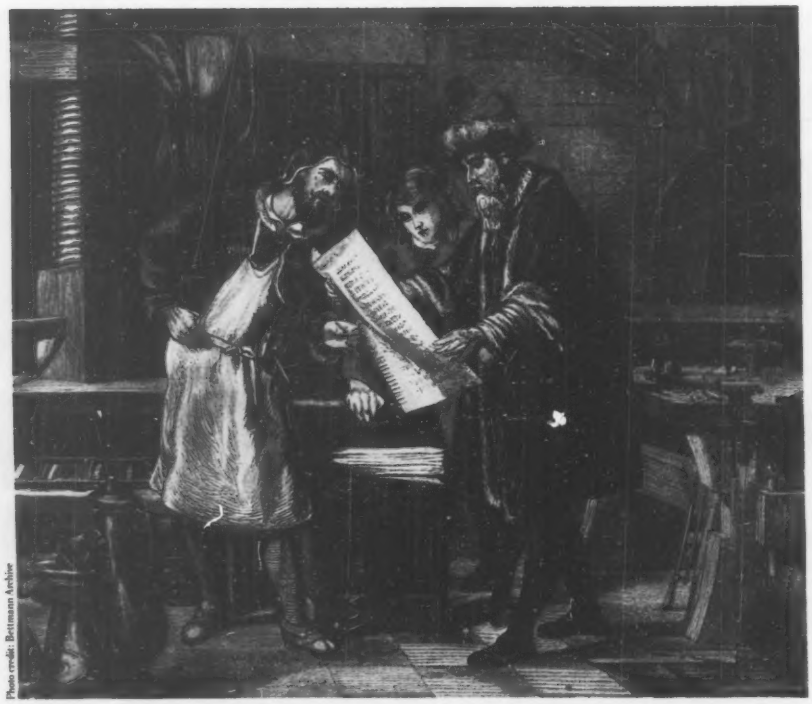


Photo credit: Bettmann Archive

Johannes Gutenberg, 1454.

Introducing the new IBM LaserPrinter: 25% faster printing, advanced features and a revolutionary streamlined design.

A printer that can raise your productivity as much as the new IBM LaserPrinter doesn't come along every day.

Not only does its advanced design make it outperform the HP LaserJet Series II, which up till now has been the benchmark in laser printing. But also, its advanced design gives the IBM LaserPrinter a dramatically new, more space-efficient shape.

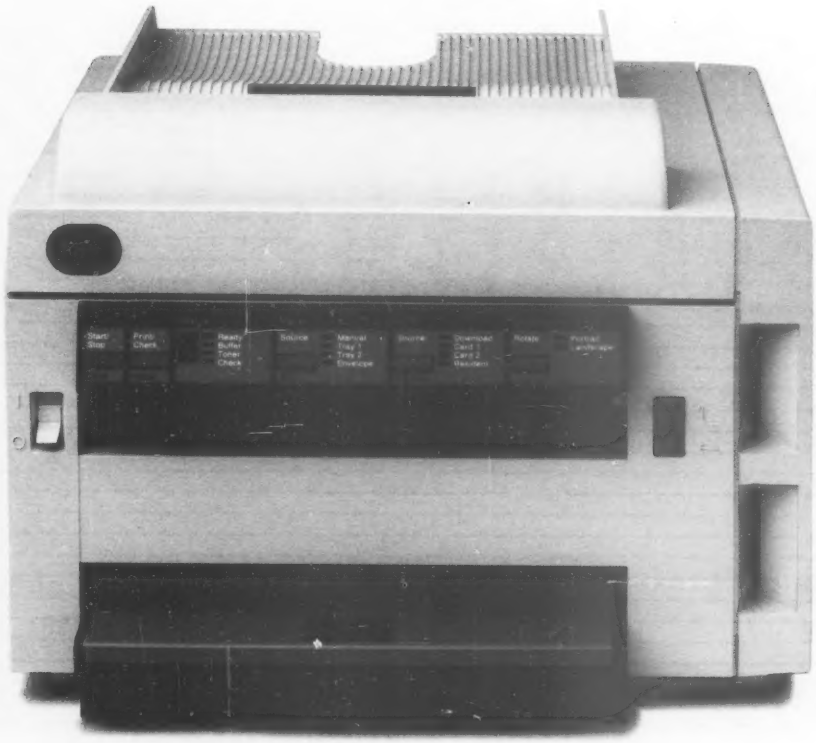
Yet with all this, there's one area in which the competition rises above us: their price.

We just advanced the art of laser printing a full 25%. The new IBM LaserPrinter gives you state-of-the-art print quality a full 25% faster than its main competitor.

Why other printers can't follow in our footsteps. The advanced design and engineering of the IBM LaserPrinter give it a footprint that's 33% smaller than its main competitor's. And that 33% gives you more usable workspace.

IBM is a registered trademark of International Business Machines Corporation. HP LaserJet Series II is a product of Hewlett-Packard Corporation. Canon is a registered trademark of Canon Inc. © 1989 IBM Corp.

an exceptional printer along.



The new IBM LaserPrinter, 1989.

		IBM LaserPrinter	HP LaserJet Series II
Speed	✓	up to 10 ppm	up to 8 ppm
Footprint	✓	291 sq. in.	432 sq. in.
Paper-handling options	✓	500 sheets, 75 envelopes	15 envelopes*
Collates letters/envelopes	✓	yes**	no
Plotter emulation	✓	standard	optional
Resident fonts	✓	10	6
Font card size***	✓	credit card	"8-track" cassette
Standard weight	✓	33 lbs.	50 lbs.
Parts***	✓	400	1000
Dots per inch		300 x 300	300 x 300
Printer emulation	✓	IBM, HP compatible	HP compatible
Printer engine		IBM	Canon
List price	✓	$2,595	$2,695

*HP envelope tray replaces standard paper tray **With paper-handling options ***Approximate

It also takes the lead in paper-handling options by offering automatic collating of letterheads, second sheets and envelopes." Plus more ample storage capacity.

See history in the making by having your IBM Authorized Dealer or IBM marketing representative demonstrate the exceptional new IBM LaserPrinter. Locate your nearest dealer by calling 1 800 IBM-2468, ext. 194.

The new IBM LaserPrinter. Suddenly, nothing else measures up.

IBM®

This message brought to you by your PC-Mainframe software.

Isn't it frustrating when your 3270 software eats so much memory you can't run your PC programs?

Meet EXTRA! Less memory, more smarts.

EXTRA! Connectivity Software™ uses less than half the memory of other 3270 programs. As little as 77K of memory for LAN connections. And a meager 44K for coax links.

You may find it surprising, therefore, that EXTRA! includes the longest list of standard features in the industry. And the highest-speed IBM®-compatible file transfer, as measured by *PC Magazine* and *PC Week*.

Tired of losing your memory?

Call us for complete information about EXTRA! Before you forget.

EXTRA!
CONNECTIVITY SOFTWARE

Attachmate

1-800-426-6283
IN WASHINGTON STATE 206-644-4010.

EXTRA! Connectivity Software is a trademark of Attachmate Corporation. IBM is a registered trademark of International Business Machines Corporation.

STOP SHAKING THE PAPER!
YOU'RE IN MY LIGHT.
WILL EVERYONE PLEASE READ TO THEMSELVES?!
MOVE YOUR THUMB!
WAAAIT, I'M NOT DONE!
BACK UP! BACK UP!
COMPUTERWORLD
SOMEBODY RIP OUT THE LETTERS SECTION FOR ME.

YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $44.00* per year — a savings of 57% off the single copy price. In addition, I'll receive special bonus sections of COMPUTERWORLD Focus on Integration.

First Name MI Last Name

Title Company

Address

City State Zip

Address shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: $48 per year

*U.S. Only. Canada $110, Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. **BUSINESS/INDUSTRY** (Circle one)
   - **10.** Manufacturer (other than computer)
   - **20.** Finance/Insurance/Real Estate
   - **30.** Medicine/Law/Education
   - **40.** Wholesale/Retail/Trade
   - **50.** Business Service (except DP)
   - **60.** Government - State/Federal/Local
   - **65.** Communications Systems/Public Utilities/ Transportation
   - **70.** Mining/Construction/Petroleum/Refining/Agric.
   - **80.** Manufacturer of Computers, Computer-Related Systems or Peripherals
   - **85.** System Integrators, VARS, Computer Service Bureaus, Software Planning & Consulting Services
   - **90.** Computer/Peripheral Dealer/Distr./Retailer
   - **75.** User: Other _____
   - **95.** Vendor: Other _____ (Please specify)

2. **TITLE/FUNCTION** (Circle one)
   IS/MIS/DP MANAGEMENT
   - **19.** Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Mgt.
   - **21.** Dir./Mgr. MIS Services, Information Center
   - **22.** Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; Dir./Mgr. PC Resources
   - **23.** Dir./Mgr. Sys. Development, Sys. Architecture
   - **31.** Mgrs., Suprv. of Programming, Software Dev.
   - **32.** Programmers, Software Developers

   OTHER COMPANY MANAGEMENT
   - **11.** President, Owner/Partner, General Mgr.
   - **12.** Vice President, Asst. VP
   - **13.** Treasurer, Controller, Financial Officer
   - **41.** Engineering, Scientific, R&D, Tech. Mgt.
   - **51.** Sales & Mktg. Mgt.

   OTHER PROFESSIONALS
   - **60.** Sys. Integrators/VARs/Consulting Mgt.
   - **70.** Medical, Legal, Accounting Mgt.
   - **80.** Educator, Journalists, Librarians, Students
   - **90.** Others _____ (Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)
   Types of equipment with which you are personally involved either as a user, vendor, or consultant.
   - **A.** Mainframes/Superminis
   - **B.** Minicomputers/Small Business Computers
   - **C.** Microcomputers/Desktops
   - **D.** Communications Systems
   - **E.** Office Automation Systems
   - **F.** No Computer Involvement

E4947-9

STOP SHAKING THE PAPER!
YOU'RE IN MY LIGHT.
WILL EVERYONE PLEASE READ TO THEMSELVES?!
MOVE YOUR THUMB!
WAAAIT, I'M NOT DONE!
BACK UP! BACK UP!
COMPUTERWORLD
SOMEBODY RIP OUT THE LETTERS SECTION FOR ME.

YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $44.00* per year — a savings of 57% off the single copy price. In addition, I'll receive special bonus sections of COMPUTERWORLD Focus on Integration.

First Name MI Last Name

Title Company

Address

City State Zip

Address shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: $48 per year

*U.S. Only. Canada $110, Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. **BUSINESS/INDUSTRY** (Circle one)
   - **10.** Manufacturer (other than computer)
   - **20.** Finance/Insurance/Real Estate
   - **30.** Medicine/Law/Education
   - **40.** Wholesale/Retail/Trade
   - **50.** Business Service (except DP)
   - **60.** Government - State/Federal/Local
   - **65.** Communications Systems/Public Utilities/ Transportation
   - **70.** Mining/Construction/Petroleum/Refining/Agric.
   - **80.** Manufacturer of Computers, Computer-Related Systems or Peripherals
   - **85.** System Integrators, VARS, Computer Service Bureaus, Software Planning & Consulting Services
   - **90.** Computer/Peripheral Dealer/Distr./Retailer
   - **75.** User: Other _____
   - **95.** Vendor: Other _____ (Please specify)

2. **TITLE/FUNCTION** (Circle one)
   IS/MIS/DP MANAGEMENT
   - **19.** Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Mgt.
   - **21.** Dir./Mgr. MIS Services, Information Center
   - **22.** Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; Dir./Mgr. PC Resources
   - **23.** Dir./Mgr. Sys. Development, Sys. Architecture
   - **31.** Mgrs., Suprv. of Programming, Software Dev.
   - **32.** Programmers, Software Developers

   OTHER COMPANY MANAGEMENT
   - **11.** President, Owner/Partner, General Mgr.
   - **12.** Vice President, Asst. VP
   - **13.** Treasurer, Controller, Financial Officer
   - **41.** Engineering, Scientific, R&D, Tech. Mgt.
   - **51.** Sales & Mktg. Mgt.

   OTHER PROFESSIONALS
   - **60.** Sys. Integrators/VARs/Consulting Mgt.
   - **70.** Medical, Legal, Accounting Mgt.
   - **80.** Educator, Journalists, Librarians, Students
   - **90.** Others _____ (Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)
   Types of equipment with which you are personally involved either as a user, vendor, or consultant.
   - **A.** Mainframes/Superminis
   - **B.** Minicomputers/Small Business Computers
   - **C.** Microcomputers/Desktops
   - **D.** Communications Systems
   - **E.** Office Automation Systems
   - **F.** No Computer Involvement

E4947-9

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

INDUSTRY INSIGHT

Nell Margolis

An overdose of Twainisms

The reports of my death are greatly exaggerated.
Mark Twain, 1897

Does it ever annoy you that you have to do a hard week's work each day for your salary, while some skinny kid who wears one white glove and sleeps in a coffin collects a fortune each year simply by holding the copyright on virtually the entire oeuvre of the Beatles?

If so, take heart: John, Paul, George and Ringo may have eluded your grasp, but it might not be too late for Mark.

The way I figure it, if the next six months are anything like the last, anyone who can somehow secure a royalty right on Mr. Twain's famous wire could be fixed for life.

There is a reason why the quote has gotten so much play in

Continued on page 114

Inside

- Leading Edge leans on Korean expertise. Page 112.
- AT&T group sets hopes on foreign sales. Page 113.
- Borland plans first public U.S. offering. Page 114.

Oracle intrigued by foreign markets

BY JEAN S. BOZMAN
CW STAFF

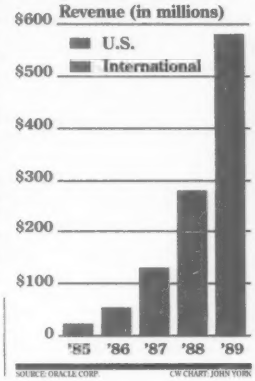
REDWOOD CITY, Calif. — When John Luongo arrived at Oracle Corp. in July 1982, he was the 26th employee to be hired by the software start-up. Today, Luongo, the senior vice-president of Oracle's International Division, is one of 4,000 employees — half of whom work overseas.

In fact, Luongo said recently, Oracle is banking heavily on international distribution of its products, deriving nearly half of the firm's $583.7 million revenue from international sales for the fiscal year ended May 31.

"We are the second-largest independent software vendor internationally, second only to Microsoft," Luongo said. "Our goal is to do business in 133 countries, which is one more country than IBM has." Right now, Oracle sells its relational database management system, applications software and computer-aided software tools in 86 countries throughout North and South America, Europe, Asia, the Middle East and Africa.

"Oracle is among the leading exporters in the software industry," said Mark Finley, an analyst with the Soundview Financial Group, Inc. in Stamford, Conn. "They're in the top three [U.S. software vendors] in terms of size, they're at the top in terms of growth, and an [export level of] 48% is about as high as you see anywhere." Even so, several U.S. hardware vendors, including IBM, generate more than 50% of their revenue from overseas sales.

Half here, half there
Half of Oracle's revenue is generated in the international market



SOURCE: ORACLE CORP. CW CHART: JOHN YORK

Oracle's international strategy is built on flexibility — and on local management. "There's an Oracle formula on how to do business overseas," said Luongo, who was an Asia-based executive for Tymshare Co. before joining Oracle. "You find good senior managers, and you hold them accountable to a business plan. But you don't micromanage them."

That hands-off approach has done well by Oracle, which has seen international sales grow from $300,000 of $2.5 million in sales in 1982 to $282 million of $583.7 million in 1989 sales. That translates into an international share of the business that boomed from 13% in 1982 to 48% for each of the last two fiscal years. Notable international customers include Sony Corp. of Japan, Pirelli S.p.A. of Italy, Sandoz Ltd. of Switzerland, Hoechst

Continued on page 116

Interleaf stalls turnkey group, lays off staffers

BY NELL MARGOLIS
CW STAFF

CAMBRIDGE, Mass. — Faced with shrinking revenue from its once-lucrative turnkey hardware business, Interleaf, Inc. last week amputated the lagging operation and aimed its resources squarely at the systems integration market.

Interleaf's Weiler

Interleaf's move out of the computer reseller arena triggered a subsequent layoff of 135 employees, approximately 18% of the company's total work force.

The cuts, said recently appointed President and Chief Operating Officer Robert K. Weiler, will range across the board on the domestic side; no positions will be eliminated from Interleaf's international operations.

The consequent corporate restructuring, according to Weiler, is expected to result in approximately $13.5 million of costs this quarter — Interleaf's third quarter of fiscal 1990 — and some $6 million in annual expenses.

"We've been enjoying giant growth, but last quarter we saw that we weren't making any money," noted Weiler, who joined Interleaf in September after Cullinet Software, Inc., where he had been serving as president, was acquired by Computer Associates International, Inc. "Eighteen months ago, hardware made up about 65% of our revenue — last quarter, it was less than 10%."

Casualties of war

Both second-quarter profits and hardware's contribution to the bottom line, said Weiler, were casualties of the so-called workstation wars.

As a result of the well-documented performance-honing and increasing price competition among the leading workstation vendors, he said, "the predicted commoditization of workstations is happening now. Our customers know that they can buy the boxes cheaper from Sun or DEC than from us."

Interleaf hardware customers that are currently under maintenance contracts will not be left dangling; Digital Equipment Corp. is assuming support responsibility for them, according to Interleaf.

Applications Expertise

Think Digital Think Ross

ROSS SYSTEMS
1860 Embarcadero Road/ Palo Alto, CA 94303/ 415-493-7850

Ross Systems and Digital Equipment Corporation are like hot dogs and ballgames. It's hard to imagine one without the other. Ross is dedicated solely to Digital with an extensive line of applications software available only for the DEC VAX.™

You chose Digital for its technological advantage. And you'll select Ross because we understand how to translate DEC technology into software benefits for our customers. Ross has 20 years of operational experience and a worldwide base of customers. We know it takes more than a big name to make an installation successful.

Free Report. Call Ross Systems today for a free white paper on DEC Windows, Rdb or Digital Technology in Applications Software.

Accounting	Distribution	Decision Support
General Ledger	**Order Entry**	**Modeling**
Accounts Payable	**Inventory**	**CrossView**
Accounts Receivable	**Purchasing**	**20/20**
Fixed Assets		**Microlink**
Purchasing		
Payroll/Personnel		
Encumbrance		

VAX is a trademark of Digital Equipment Corporation.

The Digital Standard

Daewoo drives Leading Edge

BY ALAN J. RYAN
CW STAFF

SEOUL, South Korea — The savvy of 500 development engineers working for Daewoo Telecom Co. Ltd. will be largely responsible for the success or failure of an ailing U.S. personal computer vendor.

Laptops, IBM Micro Channel Architecture (MCA)-compatible PCs and personal workstations are all in the works for Canton, Mass.-based Leading Edge Hardware Products, Inc., which filed for bankruptcy protection in February following bouts of poor management and unpopular dealer programs. Last week, Daewoo finalized its court-approved 100% equity buyout of Leading Edge, and Daewoo President Park Sung Kyou said his firm's engineers have been working diligently on new products to help Leading Edge regain its foothold in the clone marketplace. Daewoo is also providing financial, product and technical support, Park said.

In the development laboratories in South Korea, engineers are awaiting Federal Communications Commission approval on Intel Corp. 8086-, 80286-, 80386- and 80386SX-based laptops. Research and development is being conducted on MCA-compatible products and systems based on the competing Extended Industry Standard Architecture (EISA), Park said. And plans have gone beyond the consideration stage for personal workstations, he added. "We have three products we are developing simultaneously," Park said. One workstation is based on an Intel microprocessor, one is based on a Motorola, Inc. microprocessor and a third is based on Sun Microsystems, Inc.'s Scalable Processor Architecture. "When the time comes for a marketing decision, we will decide which to manufacture," he said. Leading Edge's current product line includes desktop PCs and peripherals.

Park *and Daewoo support firm's comeback*

Park said that while Daewoo markets PCs in other countries, the only PCs it will sell in the U.S. will bear the Leading Edge name. "As a corporation, Daewoo is well known," Park said. "But for PC products, as it is not as well known as the Leading Edge name."

At last week's Comdex/Fall '89 trade show in Las Vegas, Leading Edge demonstrated 12 new products that it said will be available in the first half of 1990. Among the announcements were two IBM Model 30-compatible computers, three laptops, three 80386-based systems, an 80486-based EISA system and the MCA-based D3/MC.

For now, Park and Leading Edge Chief Operating Officer John R. Sullivan said Leading Edge will be working to reestablish a good image with its dealers. "Once they do that and get back to the market share they used to command, Leading Edge should think about further growth by diversifying its product line," Park said. Other directions will be considered when a chief executive officer is hired.

In a recent meeting with *Computerworld*, Park and Sullivan said Leading Edge is aggressively working to renew its old dealer contracts and win new ones. That has meant a complete overhaul in its dealer programs, which at one time required dealers to pay before receiving merchandise.

"You have to know where you're coming from to know where you're going," Sullivan said.

At its peak three years ago, Leading Edge had in excess of 1,000 dealers. Today, it has approximately 400, Sullivan said, adding that the company is adding 15 to 25 new dealers every week.

NICKELS & DIMES

Northern Telecom, Inc. reported revenue of $1.4 billion for the third quarter ended Sept. 30, 1989, an increase of 13% from $1.25 billion in the corresponding 1988 quarter. Net earnings were $75 million, up 34% from $56 million in the third quarter of 1988.

Harris Corp. reported that net income for the first quarter ended Sept. 29 was $25.6 million, an increase of 11% from last year's income of $23 million. Sales for the period were $722.7 million, compared with sales from continuing operations of $430 million in the similar quarter a year ago. The first quarter of the current fiscal year included the operating results of **GE Solid State**, which was acquired on Nov. 30, 1988, and the results of **Lanier Worldwide (formerly Harris/3M)**, which became a wholly owned subsidiary effective April 28, 1989.

At **Bytex Corp.** revenue rose to $10.3 million for the fiscal quarter ended Sept. 30, 1989, a 14.6% increase over third-quarter 1988 revenue of $8.9 million. Net income of $1.1 million for the third quarter increased 57.6% from $689,000 reported for the third quarter of 1988.

Here's all you need to know about laser printers.

It's really quite simple. Just look for this symbol on printers that include PostScript® software from Adobe Systems; it's your guarantee of quality and compatibility. And call 1-800-952-6300 (Dept. 122) for a complete listing of PostScript laser printers, typesetters and other computer equipment. Then you'll really know it all.

PostScript and the PostScript logo are registered trademarks of Adobe Systems Incorporated in the U.S.A. ©1989 Adobe Systems Incorporated. All rights reserved.

IN BRIEF

Layoff of equals

Supercomputer maker **Stardent Computer, Inc.**, formed last month by the much-touted merger of "equals" Ardent Computer and Stellar Computer, Inc. cut its 400-person work force by 25% last week. The reduction, undertaken to eliminate redundancy, targeted functions across the board and hit approximately equally the firm's Newton, Mass., headquarters and its Sunnyvale, Calif., operations. The move further consolidates all Stardent manufacturing in Japan, at the facilities of investor **Kubota.**

Suiting up

A Federal Circuit Court of Appeals last week gave modem player **Hayes Microcomputer Products, Inc.** a green light to proceed to trial against four other modem makers on patent-infringement claims. At issue is compliance with Hayes' 1985 Heatherington'302 patent, which defines Hayes-compatibility. Hayes officials said the company expects to be in court soon with claims against **Everex Systems, Ven-Tel, Omnitel and Prometheus Products.**

Open to Logic

Donal O'Shea, formerly vice-president of operations at The Open Software Foundation, has been appointed president of Servio Logic Corp., a supplier of object-oriented database management systems in Beaverton, Ore. Alan Atlas, who was part of the OSF's development team, has become vice-president of Engineering at Visix Software, Inc.

Sharing Cray

Cray Research, Inc. completed the spinoff of **Cray Computer Corp.** last week by distributing 90% of the new company's shares to current Cray Research shareholders. The new company, headed by supercomputer designer Seymour Cray, retains 10% of the shares. The board of directors of Cray Research decided that common stock shareholders will receive one share of Cray Computer for every two shares of Cray Research that they held.

Last May, Cray Research revealed its restructuring plan to spin off $50 million in machines and manpower by creating Cray Computer. The Minneapolis-based Cray Research, headed by President John Rollwagen, will focus on its silicon-based, Y-MP supercomputer product line, while Cray Computer in Colorado Springs, Colo. turns its attention to experimental gallium arsenide chip technology and to the Cray-3 follow-on to the Cray-2 family.

AT&T computer group set for sales overseas

BY ELLIS BOOKER
CW STAFF

MORRISTOWN, N.J. — AT&T's Computer Systems division recently formed a new unit devoted to increasing sales outside the U.S.

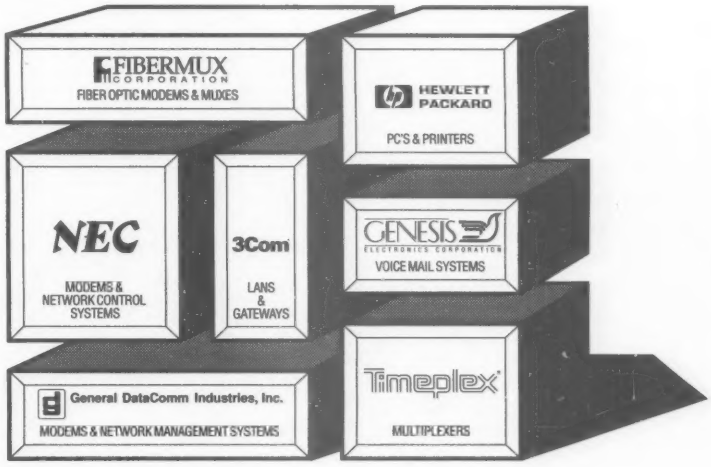
The creation of AT&T Computer Systems-International follows the ending of AT&T's European distribution relationship with Ing. C. Olivetti & Co. of Italy.

AT&T will establish beachheads in Europe through direct sales offices, according to company sources. The first of these, the sources said, opened in Paris in April, and a London office will open soon. In addition, the new group will pursue alliances and acquisitions. Just last month, AT&T acquired Istel, a British information technology services firm.

"AT&T has had a stated goal since 1986 to grow its international business," said Gordon J. Bridge, president of AT&T Computer Systems. Bridge said international activities account for less than 10% of the computer group's revenue. By emphasizing international sales through direct marketing, he said, AT&T hopes to bring its international sales profile in line with other computer vendors over the next three to five years.

John E. Boyd, former vice-president of worldwide complementary marketing, will head the new organization. In addition, AT&T said it would merge Computer Systems' reseller marketing operation with Computer Systems' direct sales force, under the direction of Curtis J. Crawford, vice-president of national sales.

AT&T is uniquely positioned for multinational customers seeking network computing solutions, according to company officials, who noted that the European Economic Community's plan for a unified European market by 1992 will bring networking technologies and services into high relief.



In the data business, sometimes it's better to mix and match.

At GTE, our data sales specialists and engineering specialists have researched, planned, designed, and implemented literally hundreds of data systems, large and small. Many times, we've found it more efficient to design a network by selecting state-of-the-art components from a variety of manufacturers. We MIX products and MATCH protocols, to meet your needs.

And when you finally make your purchases, our loyalties are with you – not to any particular brand name.

Besides knowledge and experience that span the entire telecommunications industry, GTE offers one distinct advantage. We'll stand behind any data system we sell with our highly trained service staff.

When you're ready to select a data communications system, or upgrade the one you have, do two things.

Forget everything you know about shopping. And call your GTE Account Manager. GTE, the data communications systems integrator.

GTE

NEC is a registered trademark of NEC Corporation.

THE POWER IS ON

Margolis

CONTINUED FROM PAGE 111

recent months, particularly in the computer industry context. The reason is this: People keep calling companies dead, and the companies, oddly enough, keep protesting that they are not. "Dead," in the current idiom, appears to mean anything that isn't rocketing up whatever chart or ranking measures it. By this standard, of course, anything on a downward trajectory, no matter how brief or merely cyclical, is dead beyond debate.

This leads to some fairly bizarre formulations. At least four of the 27 1988 members of the so-called Billionaire's Club — the elite list of computer companies with annual revenues in 10 or more figures — have been reported dead or about to be in recent months: Control Data, Wang, Prime and Data General. Three more Billionaires, among the biggest — IBM, DEC and Unisys — have rated Club Dead Honorable Mentions in sentences such as, "Is (blank) dead?"

If calling a multibillion-dollar enterprise defunct or even endangered because it isn't matching the galloping growth rates of up-and-comers that are proudly nearing the $100 million mark strikes you as at least marginally absurd, you probably won't rush to apply the epithet to massive industrial or geographical sectors. You don't have to do it — plenty of good folks are already. Heard that (a) the computer industry may be dead, (b) the Massachusetts-based computer industry may be dead and (c) Massachusetts may be dead? Me, too — many times.

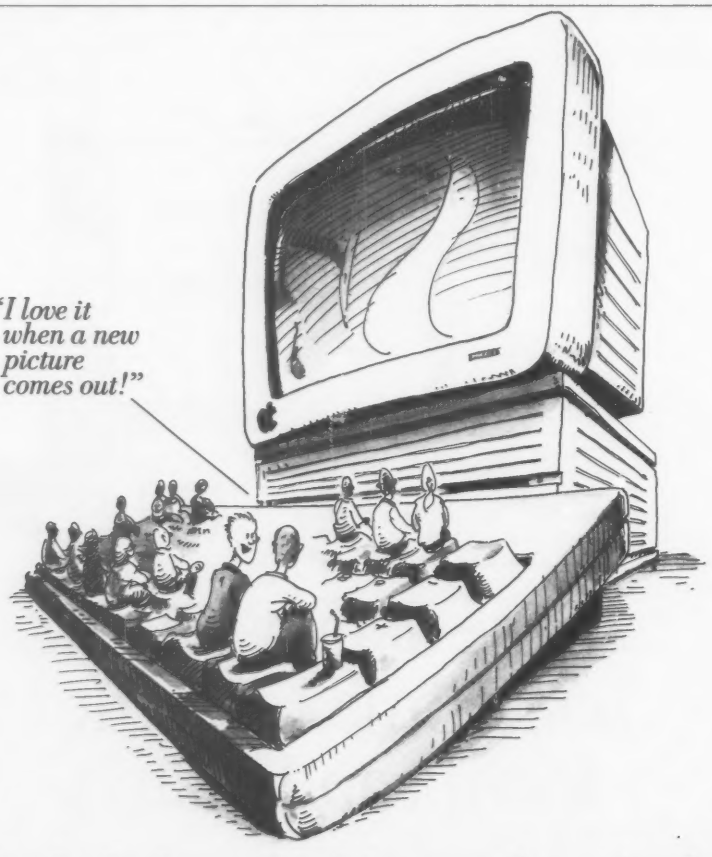
But not as often as we're all going to hear good old Sam Clemens' exaggeration line trotted out at Comeback Time. The flip side of the proclivity for draping crepe all over anything that isn't barreling down the fast lane is the passion for comeback declarations — which tend to come wrapped in Twain.

There is, however, a catch. This is it: Our culture is still far from over its love affair with the idea that the medium is the message. Certain words have a wicked tendency to turn into self-fulfilling prophecies. In business circles, inflated rhetoric often has tangible aftereffects in terms of investment dollars that dry up, talent that streams out the door and customers whose hands suddenly freeze within an inch of the nearest wallet.

If sensationalism weren't so much fun, probably some earnest old coot would point out that nobody calls a tree dead when its leaves fall; no one fears that evening means there won't be another sunrise. Why assume that only business defies both nature and cliche? Massachusetts was declared dead in the early '70s, and it came roaring back. The computer industry was declared dead in the mid-'80s, and it came roaring back. Why not assume that, as happened then, both are now going through tough times on their way to their next bouts of glory?

Meanwhile, the first tender shoots of this year's crop of comebacks are already starting to show. Last week, I heard a Wang employee bemoaning a column in a local newspaper that contrasted his embattled company unfavorably with a more robust Data General. "Look on the bright side," I reminded him, "Data General used to be dead." Paring to fighting weight and with a new can-do president in charge, Wang itself may be headed for imminent undead status. If you can't buy into the royalty rights to the Mark Twain line, maybe you can bet points on how many times you'll see it in print between now and, say, Memorial Day. Odds are good that the number will be *too* . . .

Margolis is *Computerworld's* senior editor, industry.



Catch the latest blockbusters from Apple at Leasametric Data Communications.

Now you can catch all of Apple's latest hits at Leasametric Data Communications, Inc. Premiere products include the high performance Macintosh® IIcx. The versatile Macintosh SE/30. Or the entire LaserWriter®II family of products. And much, much more.

Leasametric Data Communications' supporting cast also brings you great performances with service that includes a toll-free phone number for on-line diagnostics. Plus, our short and long-term rentals, along with operating and finance leases are just the ticket to make it all available.

To find out how Apple can take a starring role in your company's latest production, just call the Leasametric Data Communications office nearest you.

Authorized Value Added Reseller

LEASAMETRIC
Data Communications, Inc.

Northwest: (800) 343-7368, (415) 574-5797 • Southwest: (800) 638-7854, (818) 708-2669 • Central: (800) 323-4823, (312) 595-2700
Northeast: (800) 221-0246, (201) 825-9000 • Southeast: (800) 241-5841, (404) 925-7980 • London: 011 44 923 897 000

© Leasametric, Inc. 1989. Apple, the Apple logo, Macintosh and LaserWriter are registered trademarks of Apple Computer, Inc.

Borland stock bound for U.S.

BY CHARLES VON SIMSON
CW STAFF

SCOTTS VALLEY, Calif. — Making good on a promise several years old, Borland International said recently that it will open its shares to American trading by making its first U.S. public offering on or about Dec. 11.

Pending approval from the Securities and Exchange Commission of its registration statement, Borland will release just over two million shares of common stock on the North American Securities Dealers Association over-the-counter exchange (NASDAQ). These would be in addition to the approximately 12 million Borland shares that are currently being traded on the London Stock Exchange, where the company's stock closed at about $9.40 on the day of the announcement of the American offering, close to its 52-week average.

The American offering will create a liquid market between the London exchange and NASDAQ. In addition, it will make Borland issues more accessible to American portfolio managers and fund investors, who are often limited to domestic stocks. Moreover, according to analysts, technology investors who understand Borland's business are concentrated in the U.S.

"There is a larger population of investors who would like to own Borland as U.S. stock," said Charlotte Walker, an analyst with the New York office of County Natwest, a London-based investment house. "It is a pain in the neck to keep tabs on what a London stock is doing."

The More Important Your Data, The More You Need The SAS® System.

Data as critical as yours demand the SAS System, the world's leading data analysis and presentation software. Whether you're projecting regional sales into the next quarter or economic trends into the next decade, you can't afford to risk your results — or your reputation — on anything less.

Only the SAS System gives you immediate access to over a hundred powerful, practical, *proven* tools for every conceivable application: data access and management . . . reporting and graphics . . . business planning, financial management, and decision support . . . project management . . . quality improvement . . . and applications development. And because the SAS System is modular, you can add new capabilities as your needs grow and change.

You'll also receive expert technical support, documentation, and training. All from SAS Institute Inc., the number one name in data analysis.

Yours for 30 Days . . . FREE.

Find out why world leaders in business, industry, government, and education rely on the SAS System. For a free 12-page SAS System executive overview, plus details about a no-risk software evaluation, give us a call at (919) 467-8000. In Canada, call (416) 443-9811.

The SAS® System. More Choices for More Applications than Any Other Software.

SAS®

SAS Institute Inc.
Software Sales Department
SAS Circle ☐ Box 8000
Cary, NC 27512-8000
Phone (919) 467-8000
Fax (919) 469-3737

The SAS System runs on mainframes, minicomputers, workstations, and personal computers.

SAS is a registered trademark of SAS Institute Inc.

Copyright © 1989 by SAS Institute Inc.
Printed in the USA.

Oracle

FROM PAGE 111

AG of West Germany and the Australian Navy.

Oracle's international sphere of influence is divided into four regions: Europe, the Americas, Asia/Pacific and Middle East/Africa. Next year, Oracle will add a small business in Eastern European bloc nations to that latter region, Luongo said.

"We know that Oracle is already being used in the Soviet Union," he added. "But we still haven't sold a copy there. People tell us, though, that they'd rather buy it than 'borrow' it, because that way they would get Oracle support."

Many countries have a wholly owned Oracle subsidiary within their borders, including the People's Republic of China, Venezuela and New Zealand. In others, local distributors sell Oracle products. In all, Oracle has 29 wholly owned subsidiaries and 28 distributorships worldwide. Each country tailors the Oracle advertisements and marketing strategy to its own cultural boundaries, according to Luongo.

That means that the emphasis of the marketing plan shifts — along with the translation of the ad copy. "The content of the ad is culturally dependent," Luongo explained. A printed advertisement that makes customers chuckle in one country can make those in another nation cringe.

The follow-up to the ad itself may also differ according to each country, he said. In some, a seminar would be appropriate, while in others a call to an Oracle sales "hotline" would be the preferred advertising method.

Pushed to the limit

Either way, Oracle seems bent on pushing its current international edge to the maximum advantage. For example, Oracle feels it gained an early lead in Mexico when the nationalized oil company there, Pemex, standardized on Oracle. Now, Oracle is looking to increase its market share in Mexico — and, in Luongo's words, "to become the leading supplier of software in Latin American countries."

No matter where the software is being sold, though, support and service are the key to follow-up sales, Luongo said.

"You have to have an ongoing relationship with a client," he said. "You don't just drop a tape on them and run. Our view is that we can go back to a satisfied customer and sell him more software."

BANKERS TRUST KNOWS THE VALUE OF A 24-HOUR-A-DAY GLOBAL NETWORK.

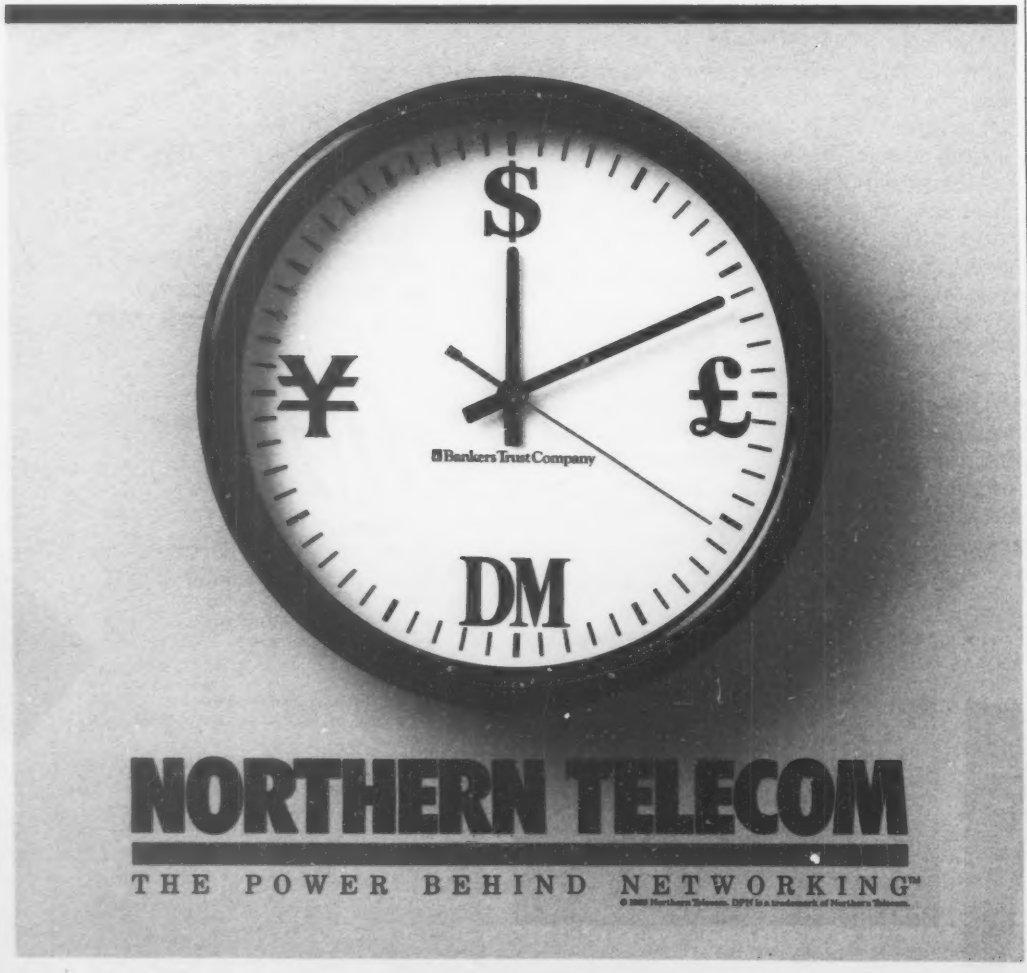
A global data communications network from Northern Telecom has made every time zone in the world more accessible for Bankers Trust.

It provides 24-hour-a-day transfer throughout the world's financial centers. And because the DPN-100 packet family is totally modular, the bank can expand almost anywhere. Without replacing equipment.

The DPN-100 also offers compliance with international standards like Open System Interconnection (OSI). As well as with System Network Architecture (SNA) and Display Systems Protocol devices. So it can network different vendor hardware and integrate information-handling functions.

Discover the benefits of our DPN family of packet switches, the data network that can grow with you. Call 1-800-543-9806. You'll find it's like money in the bank.

nt northern telecom



EXECUTIVE CORNER

Changing of the guard

Sugar Land, Texas-based **BMC Software, Inc.** announced today that **Richard A. Hosley III,** president and chief executive officer, will become **vice-chairman** of the company after March 31, 1990, which is the end of its current fiscal year. At that time, **Max P. Watson Jr.** (at left), the company's current chief operating officer, will succeed Hosley as president and CEO. **John J. Moores** will continue as chairman of the board of directors. Watson has been employed by BMC Software since 1985 and has been COO since January 1989. Prior to his appointment as COO, Watson was senior vice-president of sales and marketing. Before joining BMC Software, he was employed at **Wang Laboratories, Inc.** and **IBM** in various sales and marketing capacities.

Hellene S. Runtagh has been named an officer of **General Electric Co.** and appointed president of GE Information Services. Both positions went into effect on Oct. 2. Runtagh, 41, was president of **Decimus Corp.**, a San Francisco-based unit of General Electric Capital Corp. that is involved in financing computers. Prior to serving as president of Decimus, Runtagh was senior vice-president of **Calma Co.**, a former GE computer-aided design subsidiary, which is now owned by Prime Computer, Inc.

A future for training managers?

MIT report suggestions could yield benefits — if firms opt to follow them

BY ALAN RADDING
SPECIAL TO CW

The two-year study released by MIT in May, "Made in America: Regaining the Productive Edge," is one of many recent reports concluding that U.S. corporations should invest more money and effort in training their workers. The recommendations, if acted on, suggest an upbeat future for managers responsible for training information systems professionals.

Fortunately for people in the field, most corporations readily accept the need for training in IS. Because of the rapidly changing nature of the technology involved, IS professionals nationwide average about 10 days of technical training per year, according to one consultant.

However, finding a position in IS training management is likely to be a challenge; only large companies with sizable IS staffs maintain full-time positions for this function. Often, the positions are filled in-house, so openings are rarely advertised or handled by outside recruiters, according to Brian Hoffman, a vice-president at the recruitment firm Winter, Wyman & Co. in Waltham, Mass.

The IS curriculum is an evolving one, focusing on technical training for the professional staff but also gradually incorporating instruction in management and interpersonal skills. IDS Financial Services in Minneapolis, for example, is offering courses on change management, writing and communications, according to training manager Andrea Dettloff.

In organizations with a large IS department, the training manager may have 100 or more people reporting to him, based on the traditional rule of thumb of one trainer for every 100 staff members. In small IS units, an individual manager may coordinate instruction delivered only by outside vendors.

The management of IS training calls for a somewhat unusual mix of skills and interests as people in the positions straddle the worlds of IS, education and management.

Training managers meet with technical managers to determine training needs and plan curricula. They find appropriate instructors from either an in-house staff or vendors; schedule and coordinate the sessions; supervise such administrative functions as registration and billing; and perform management tasks such as budgeting.

"Ninety-eight percent of this job is management skills," says Dianne Solomon, who supervises 14 people as director of the Bureau of Training for the Commonwealth of Massachusetts' Office of Management Information. "I spend much of my time listening to managers of systems groups to get a sense of what their people need. I also need to understand what quality education entails."

Training management is not a common stop on the traditional IS career path from programming and analysis to management. Relatively few IS training managers have risen through the IS ranks, and few IS instructors advance to manage the function. More often, training managers come from business units.

Solomon started her career with a master's degree in library science, specializing in computer-based systems. She then studied systems analysis and got involved with training computer users. Although she is not an IS professional, she feels she is familiar enough with IS technology and concepts to consult with systems managers about planning training programs.

Carla Gregory, education coordinator at the Federal Reserve Bank in Richmond, Va., started in a management training program after graduating from college with a degree in political science. The program led to the research department, where she began writing reports. Many of the reports involved automation systems, and she began designing and writing IS documentation. "From there, it just grew into training," she says. Along the way, she acquired a master's degree in adult education.

Once in the position of IS training manager, it is not clear where one goes next, managers say. Gregory says that given her bank's small training operation, there is nowhere else for her to go at the bank while staying in the educational field. "This position doesn't lead anywhere, unless you go to a similar one in a bigger company" or join a vendor of IS training, she says.

Gene Wade, IS training manager at Amoco Corp., simply fell into training management and is not sure where his unconventional career path will take him next — perhaps, he says, to corporate management training.

Wade, who considers himself a maverick because of his series of seemingly unrelated assignments, spent a year as a Fortran coder but does not consider himself an IS professional. After getting an MBA, he did stints in human resources and marketing before directing a program in management by objectives. From there, he moved into his current position, in which the equivalent of 45 full-time employees report to him, and his program is expanding rapidly as Amoco revises the IS training curriculum for the 1990s.

Salaries for IS training managers are usually better than those of trainers in other functions, Solomon says. IS trainers make $30,000 to $35,000 a year, while IS training managers may earn from $35,000 to $60,000, depending on their department's size. Gregory says her pay as education coordinator at the Richmond Federal Reserve Bank is equivalent to that of a senior programmer/analyst.

Radding is a Newton, Mass.-based author specializing in business and technology.

> THE MANAGEMENT of IS training calls for a somewhat unusual mix of skills and interests as people in the positions straddle the worlds of IS, education and management.

IT'S CALLED THE GOLDEN GATE FOR GOOD REASON

System professionals can discover career enrichment, personal satisfaction and rewarding employment with our prestigious clients. Sophisticated technologies include Mainframes, Minis, Micros, PC's, Networks, Communications, System Software, Data Bases, 4-GL's, design, development and software engineering.

THE SEARCH FIRM, INC.
595 MARKET STREET, SUITE 1400, SAN FRANCISCO, CA 94105
(415) 777-3900 FAX 777-8632

Application Programming Manager

BIS, Inc. is a progressive insurance services development company located in Southwestern Minnesota.

The ideal candidate would have a B.S. or equivalent in Computer Science, strong technical background, effective communication skills, two years Property/Casualty insurance experience, CPCU designation or working towards, and a minimum of two years management experience.

This position will provide technical and supervisory support for analysts, programmers, user support personnel, and the development of software for the Property/Casualty industry for a multi-company environment.

Submit resume and starting salary requirements in complete confidence to:

Asst. Personnel Manager
Berkley Information Services
109 South Freeman
Luverne, MN 56156
Equal Opportunity Employer

The Computer Merchant, Ltd., a recognized leader in software and consulting services, has multiple openings nationwide in Fortune 500 companies.

IBM OPENINGS

- COBOL
- DB2/ORACLE/SQL
- ADSO/IDMS
- ADABASE/NATURAL
- CICS
- MUTUAL FUNDS

Programmer Analysts / Software Engineers / System Managers / Operators / Q.A. Engineers to work in the following areas: Software Engineering • Mutual Funds • Shareholder Accounting • Graphics • ATM's

Minimum two years of experience.

Send your resume to:
The Computer Merchant, Ltd.
80 Washington Street, Bldg. E
Norwell, MA 02061
(617) 878-1070 or
(617) 878-4712 (FAX)

Immediate Contracts and full time Positions Available:

Call or Fax Resume to

DataLink Corporation
153 Waverly Place
Suite 3 - Seventh Floor
New York, N.Y. 10014

212-243-5488
Fax # 212-989-6457

"The Missing Link in D.P. Recruiting"

PROGRAMMERS
Contract Assignments
$28-32 Hr + Per Diem

Jr. to Sr. level programmers with 1+ yrs. exp. in IBM & other languages (PASCAL, "C," ASSEMBLER, PL-1, etc.). Contract assignments 12 mos. +. $28-32/hr. + per diem +. In confidence, contact Al Madsen, CEC.

CORPORATE PERSONNEL CONSULTANTS, INC.
3705 Latrobe Drive, Suite 310
Charlotte, NC 28211
(704) 365-1800

State-of-the-art opportunities in sunny South Florida!

American Savings & Loan, headquartered in the Miami-Ft. Lauderdale area, is one of Florida's most successful financial institutions with $5.8 billion in assets. The efficient processing of information is vitally important to our overall operation and we utilize some of the latest technology in our efforts.

Our MIS environment involves use of state-of-the-art computer hardware and software systems including IBM 3090 mainframe and ESA. We also support an extensive data communication network that includes IBM Token Rings, PS/2 workstations, host-to-host links and the latest in telecommunication devices.

Expansion of our MIS Department has resulted in SEVERAL immediate opportunities to join our deposit and lending systems project teams.

- PROGRAMMER ANALYSTS/ Lending—Positions require at least 2 years experience with any installment lending application.
- PROGRAMMER ANALYSTS/ Deposit Systems—Positions require at least 2 years experience with any banking deposit system package; Systematics preferred.

$2,000 SIGN-ON BONUS

We offer highly competitive salaries, an exciting new flexible benefits package and relocation assistance. For consideration, please send resume with salary requirements to: Vice President-Human Resources, American Savings, 17801 N.W. 2nd Ave., Miami, FL 33169-5089. An equal opportunity employer, m/f/h/v.

AMERICAN SAVINGS OF FLORIDA
We Build Futures.

World-class challenge at Global Dynamics.

At Global Dynamics, we give new meaning to the term "world class." Our contract programming and systems consulting services are utilized by major corporations around the globe. Which means that you'll have the opportunity to work with the industry's latest advancements while enjoying a wide range of local assignments. Consider Global Dynamics. You'll discover a whole new world.

We have current opportunities in the following areas:

- IBM SYS 38, AS/400, RPG III
- Macintosh Consultants
- IDMS ADS/O, DBA's
- Model 204 Consultants
- DB2 Consultants
- OS2 Consultants
- TPF all levels in the U.S., Europe, and Australia
- COBOL, CICS, VSAM
- VM Systems—Internals
- STRATUS—System 88
- Communications, VTAM, SNA
- Tandem Consultants

Interested candidates please call Susan Katz or Brian Cott at 1-800-346-5948 or 1-415-946-0601. Or send your resume to: GLOBAL DYNAMICS, INC., 2890 North Main Street, Walnut Creek, CA 94596. Fax #: 1-415-946-9247. EOE.

GLOBAL DYNAMICS INC.

ATLANTA SOUTHEAST
(404) 447-8773
Permanent Placement Employment Agency Fees/Rates and Salaries

BRANNON & TULLY

Start-up/Large Development Teams and Hi-Tech Offers Now

ADABAS NATURAL P.As
CICS COBOL DB2 P.As
DEC or TANDEM P.As
VM XA SYSTEMS
STOCK BOND PKG P.As

BRANNON & TULLY, INC.
3169 Holcomb Br Rd #675
Norcross, GA 30071
(404) 447-8773

SYSTEMS PROGRAMMER

The radio Bible-teaching ministry of Chuck Swindoll needs a systems programmer to install and maintain a wide variety of IBM and third-party software on our IBM 4341 with VSE/SP operating system, CICS, and Computer Associates' DATACOM/DB. Send resumé and salary requirements to:

INSIGHT FOR LIVING
Suite 100
211 E. Imperial Highway
Fullerton, CA 92635

Database Analyst. Design and implement transportation software with distributed process ability through a Novell Local Area Network interface bridge for MicroMileMaker using C programming language; design relational database using database organization including Bachman diagram E-R model; tune Oracle database on Compaq 386/25 server in a Xenix UUCP network production environment; maintain Xenix 286 operating system; set-up production environment and 3 Com/Novell Local Area Network; utilize telecommunication systems including data flow control, RS-232 serial communications, protocol and OSI 7 layers standard. Master of Science in Computer Science required together with 3-1/2 years experience in the job offered or 3-1/2 years experience as a Systems Engineer &/or Programmer/Analyst. Must have 1 course in each of the following: telecommunications systems, analysis of algorithms, programming languages, operating systems & advanced database organization. Experience as Systems Engineer &/or Programmer Analyst &/or Academic Research must have involved the design of a database in a conceptual and logical model, tuning a database, developing a recovery system for a database & developing monitor software on a mini-computer to control attached PC's connected through RS-232 interfaces. 40 hours M/F, 9 a.m. to 5 p.m., $35,000 per year. Send resume and Social Security Number to: Illinois Department of Employment Security, 401 South State Street - 3 South, Chicago, Illinois 60605, Attention: Mr. Robert S. Fellon, Reference V-IL 9703-F. AN EMPLOYER PAID AD.

Product Marketing Mngr. PhD Microwave Electronics & 2 yrs exp or 2 yrs Engnr Microwave Applications or, as alternative to PhD, Masters + 4 yrs exp. Must possess demonstrable understanding/skills in GaAs & silicon transistor device models operating at frequencies in 0.1 to 40 GHz range/ state of the art techniques for the extraction of models for microwave transistors operating in the 0.1-40 GHz range/software for MMIC & high frequency analog device & circuit testing/development of macro language control scripts for use w/microwave testing software. Organization/efficient writing of marketing literature explaining sophisticated microwave concepts so easily understood by customers w/limited engrg background. Demonstrable skills in presenting marketing proposals/technical information. Provide insight/leadership re development of marketing strategy/literature/technical sales support for state of the art microwave/high frequency analog CAE/CAT/CAM software tools. Develop marketing strategies for use of company software products in design/test/manufacturing optimization of circuits/components/systems operating at frequencies in 100 MHz to 40 GHz range. Time precision is in the PS range. Prior experience/understanding in design/measurement of Microwave Monolithic Integrated Circuit (MMIC) devices req. Develop literature showing customers how to apply new state of the art software to optimize performance/manufacturing cost reduction. Salary $50,000/yr. 40 hr wk. Location & interviews Westlake Village, CA. Send resume w/this ad to Job #WS 10356, PO Box 9560, Sacramento, CA 95823-0560. Not later than 12/11/89.

GPIB Software Engineer: Produce software used to control hardware interfaces. Programming involves both low-level control of the interface card as well as high-level applications programming designed to simplify the user's experience with GPIB (General Purpose Interface Bus). Produce other types of software of a scientific nature, including modules to gather data from data acquisition devices as well as modules to manipulate the data so acquired, as by Fourier Transform or Curve-fit algorithms. Requirements are a Bachelor's degree in Computer Science with at least six months experience in the job offered or at least six months experience in an instrument control environment. Experience must include writing GPIB software; UNIX operating systems; high-level programming languages, particularly C; assembly languages; networking theory and practice, especially networks based on bus architectures. Hours are 8:00 a.m. to 5:00 p.m., 40 hours per week. Salary is $31,000 per year. Apply at the Texas Employment Commission, Austin, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778, Job Order #5518044. Ad paid for by an Equal Employment Opportunity Employer.

SYSTEMS AND PROGRAMMING SUPERVISOR

$55,596 - $67,572 annually plus excellent benefit package. This position manages the Systems & Programming Division of the Information Systems Dept., of the City of San Jose, and provides systems & programming analyses for all City depts.

Requires degree in Computer Science, Business Admin. or closely related field plus five (5) yrs. exp. in computer programming and systems analysis.

A completed City of San Jose job application and supplemental questionnaire must be received in our office by 12/15/89. Contact: **City of San Jose Personnel Dept., 801 N. First St., Room 207, San Jose, CA 95110. (408)277-4205.**

Questions regarding qualifications should be directed to Ed Normandy, (408)277-4205.

ACP/TPF SOFTWARE SYSTEMS ENGINEER desired. Provide support and continued expansion in ACP/TPF environment of the Real Time Cargo and Freight System. Perform analysis of customer's requirements, design of system functionality, coding, testing and implementation. Assist programmers and other analysts in program applications and design as well as testing and software implementation. Coordinate activities of team members and insure that software and system standards are maintained according to the principles of an ACP/TPF environment. Provide system maintenance and maintain system integrity. Applicants required to have a bachelors degree in Computers, Math or Engineering with at least two years ACP/TPF Systems Analysis and Assembler Programming. Education and experience will be found acceptable if applicant has a combination of professional development courses, training, and experience equavalent to a bachelors degree in Computers plus two years experience in ACP/TPF Systems Analysis and Assembler Programming. Annual salary will be $34,000 for a 40 hour work week. Additional salary may be paid up to $39,000 if education and experience warrant. Interested applicants contact the Oklahoma Employment Security Commission (7202), 3105 E. Skelly Drive, Tulsa, OK 74105-7202. Phone: (918) 749-6861. Refer to job order number 091168. Paid by an Equal Opportunity Employer.

Full time and permanent position as a Hardware/Software Designer is available with a firm that designs, manufactures and sells specialized computers. The position consists of assisting in the development of a new generation of computer products; to participate with other members of the senior technical staff under the leadership of the company's Technical Director in the necessary research pertinent to, and the functional specification of, an advanced computer system and associated software packages that are optimized for the real-time simulation of continuous dynamic systems, and that provide an order of magnitude greater performance than the current products in this area. Providing leadership in detailed design activities. Helping to develop the capabilities of some of the less experienced members of the company's technical staff. Requires a Bachelors' Degree in Mathematics or Computer Science with eight (8) years experience as a computer software and architecture designer which included financial and management experience. Hours are from 8:00 a.m. to 5:00 p.m., forty per week. Salary is $45,500.00 per year. Send resume to 7310 Woodward, Room 415, Detroit, Michigan 48202. Refer to #61389.

SYSTEMS PROGRAMMERS/ INSTRUCTORS

If you possess the ability to communicate your skills to others and have a desire to travel, continue your education and be your own boss, then read on. Previous teaching experience a plus. Verhoef Information Packages, a leader in DP Education is seeking instructors in the following areas:

MVS INTERNALS
MVS TUNING
MVS DEBUGGING

Excellent benefits: 75% travel: 16 weeks paid vacation. Send resumes to:

NENA SILOS
Verhoef Information Packages
799 Bloomfield Ave.
Verona, N.J. 07044

SOFTWARE ENGINEER: Develop new operating systems software for the iRMK® kernel and a new distributed real-time operating system. Design, implement and evaluate new operating system features. Write external and internal design documents. Interact with product marketing engineers, technical marketing engineers, technical publication engineers and customer support engineers. University level training, research background or experience in design of operating systems and internals, distributed systems, C and PL/M languages and UNIX® and implementation and design of operating systems. Master's equiv./Computer and Systems Engineering.. $2,800/mo. Job Site: Hillsboro, OR. Clip this ad and send with resume to: Employment Division, Attn: Job Order No. 2418651, 675 Union St., NE, Room 201, Salem, Oregon 97311. UNIX is a TM of AT&T. iRMK is a TM of Intel Corporation.

*** DP PROS ***

We are continually looking for the following skills on a national and international basis. Contractors welcome.

TANDEM/COBOL/SMAX
S-36/400 RPG/COBOL
IDMS/DB-2/ADABASE
CICS/COBOL/BAL/IMS
PC/LAN EXPERTS
UNIX/C/3L2S/TCP/IP/SNA
S/W OR H/W ENGINEERS
HP/VAX/COBOL
SYST PROG/S/VS/UNIX/VMS

Please call, fax, or mail resume to:

Electronic Search - DP Div.
9250 N. River Road - Suite 7040
Rosemont, IL 60018
Phone: (312) 318-9555
Fax: (312) 318-9564

One thing every executive should have after retirement:

An adventure.

Gold watches are fine for some retired executives. But after a lifetime of experience, moving from the trenches to the front offices, your knowledge is worth more—to us and to hundreds throughout the world in need of your special skills.

Through the International Executive Service Corps—the not-for-profit organization that sends U.S. managers to help businesses in developing nations—you can volunteer for short-term assignments in foreign countries where you're truly needed. Although you will not be paid, you and your spouse will receive all expenses, plus the personal satisfaction of teaching others while you discover more about yourself.

It's an adventure of the spirit. And the time to explore it is now. So please, don't let this golden opportunity pass by. Send for more information today.

International Executive Service Corps

Ad Council

Turn your lifetime of experience into the experience of a lifetime.

YES, I'd like to share my lifetime of experience with others. I recently retired from my position as a hands-on manager with a U.S. company. I also understand that volunteers and their spouses receive expenses, but no salary. Please send me more information now.

Name _____

Address _____

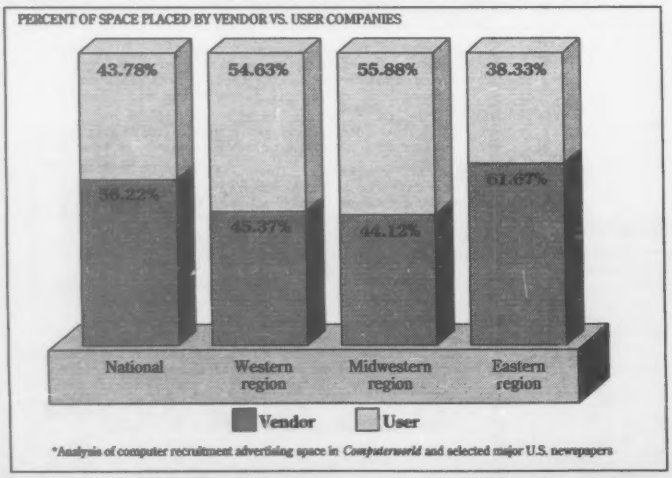
City _____ State _____ Zip _____

In what publication did you see this ad?

Write to: IESC, 8 Stamford Forum, P.O. Box 10005 Stamford, CT 06904-2005. Or, for faster response, call this number: (203) 967-6000. BP

CAREER INDEX

September 1989 computer recruitment advertising activity*



*Analysis of computer recruitment advertising space in *Computerworld* and selected major U.S. newspapers

SOURCE: CW PUBLISHING, INC.'S RECRUITMENT MARKET RESEARCH DATABASE

CW CHART: FRANK C. O'CONNELL

National Medical Enterprises, Inc., a $3.6 billion health care corporation, is recruiting for highly skilled data processing professionals for our Information Systems Department conveniently located in Santa Monica.

SR. ANALYST/ PROGRAMMERS-VAX

These individuals will be involved in developing and supporting applications which integrate clinical and hospital information. Qualified candidates must have:

- 3-5 years experience in VAX/VMS based systems and application development.
- Programming experience using COBOL and "C" language as well as knowledge of Digital's VMS, RDB/SQL and ACMS software.
- Must have a working knowledge of IBM PC and PC compatibles: including DOS, communications software.
- Experience with DEC forms or FMS and DECNET is a plus.
- Experience with Executive Software language is a plus.

SR. ANALYST/PROGRAMMERS-SYSTEM 38/AS400

These individuals will be working in an on-line environment comprised of a network of eighteen mid-range AS400/38 computers which are interfaced to our larger mainframe environment. Qualified candidates must have:

- A minimum of 3-4 years Systems 38/AS400 programming and analysis.
- Strong CL & RPG III skills.
- Communication experience with 38/AS400 and systems software expertise a plus.

We offer an excellent salary and flexible benefits package. For consideration, please send your resume and salary history to:

NATIONAL MEDICAL ENTERPRISES, INC.
P.O. Box 2140, Santa Monica, CA 90406
Attn: Mike Duda

PRINCIPALS ONLY PLEASE
An Equal Opportunity Employer M/F
We Support a Drug-Free Workplace

HOSPITAL GROUP

Join Our Aggressive Applications Development & Operations Support Teams.

CAROLINA POWER & LIGHT COMPANY, a major force in Southeastern power generation and distribution, offers information systems professionals the kind of environment that will provide long-term professional and personal satisfaction—the latest in proven technology and an appealing lifestyle. We're looking for data processing professionals to join our team and provide aggressive applications development and operations support.

Along with wide use of personal computers, we're operating one IBM 3090-300, one IBM 3090-200, and one Amdahl 5890-300. The CICS on-line environment has been growing at the rate of 40% per year. Recently, we have expanded to a new Data Center. We're operating under MVS/XA and VM/CMS utilizing an SNA/SDLC network consisting of over 3,000 terminals and printers. Our programming languages are COBOL, SQL and DATACOM's IDEAL. We have adopted DB2 as our standard for new application development and are aggressively expanding our use of PC-based and mainframe-based CASE tools.

We have recently completed a large strategic planning study and have a significant backlog of technical and application development projects. We are currently seeking the following:

APPLICATIONS DEVELOPMENT

Programmers

Positions require 4+ years of structured coding experience. Highly desired experience would include COBOL, CICS, DB2 and DATACOM. A four-year degree is preferred.

Systems Analysts

Positions require 4+ years experience in a development environment versus a maintenance environment. Highly desired experience would include structured design techniques, data modeling experience, prototyping and Method/1 knowledge. A four-year degree is preferred.

DATABASE ANALYST

Position requires 4+ years experience utilizing a relational database engine, preferably DB2 or DATACOM/DB. Desirable experience includes formal participation in the physical DB design activity of development projects. A four-year degree is preferred.

SR. DATA COMMUNICATIONS ANALYST

Position requires 5+ years experience in data communications in a large systems SNA environment. Knowledge of PC Local Area Networks desirable. Excellent written and oral presentation skills as well as project management and planning experience are a must. A four-year degree is preferred.

The quality of life in the beautiful Carolinas is one on which to boast. We offer a mild but seasonal climate, a moderate cost-of-living, excellent schools and universities, and a myriad of cultural and recreational activities. With CP&L located in the capital city of Raleigh, the mountains and seashore are just a few hours away.

CP&L offers competitive salaries, excellent benefits, and opportunities to advance. If you're interested in becoming part of our important team of professionals, send resume with salary requirements to: **Susie Brown, Senior Recruitment Representative, Dept. CW11209, CAROLINA POWER & LIGHT COMPANY, P.O. Box 1551, Raleigh, NC 27602.** An Equal Opportunity/Affirmative Action Employer.

CP&L
Carolina Power & Light Company
Energy In Operation

YOU'VE GOT CHOICES IN NEW ORLEANS

Lets face it, as an experienced Systems Engineer, you've got choices. So why not choose the best. Entergy Services, Inc., with its New Orleans location, offers the experienced data processing professional both the excitement of working in a state-of-the-art IMS DB/DC environment and the pleasures of living in one of the nation's most interesting cities. New Orleans may be known for great food and fun, but Entergy Services is known for its technology. The current hardware environment includes two 3090/400s in an MVS/XA operating system environment.

Systems Engineers (Analyst/Programmers)—These positions involve the maintenance and enhancement of medium to highly complex applications utilizing high-level languages to develop multi-system interfaces and to provide production support. Job requirements are one to three years experience programming in COBOL and/or PL-1. Knowledge of OS/JCL, IMS, DB/DC, ADF, Mark IV, and dBASE a plus.

Systems Engineer (P.C. Applications & Support)—The position will be responsible for the development and maintenance of marketing and financial systems. The technical environment includes PL/1, SAS, EASYTRIEVE, COBOL, PC-DOS, dBASE III PLUS/FOXBASE/QUICKSILVER/CLIPPER/DBXL, ATTACHMATE and LAN. Job requirements are three to five years experience in development of systems for personal computers. Mainframe experience is preferred but not necessary.

Entergy Services, Inc. offers an exceptional relocation package including a relocation allowance (one month's salary)...paid moving expenses...paid house hunting trip...Mortgage Interest Differential, plus Interim Living. For more information, call our toll-free number below or send resume to: **T. Porter, Entergy Services, Inc., P.O. Box 61000, New Orleans, LA 70161.**

1-800-231-4481
In Louisiana call collect (504) 569-4965

Entergy Services
An Entergy Company

An Equal Opportunity Employer M/F/H/V

AS/400 S/38

THE PROFESSIONAL'S CHOICE...

...is Whittman-Hart, the largest diversified technical services company (dedicated strictly to the AS/400 and S/38 systems) in the country. We provide technical support to many of the top Fortune 20 companies in America. We are a team of experts, mastering technologies, executing details and finding solutions. Our accelerated growth and phenomenal success has created a need for talented Data Processing PROFESSIONALS to share in a future of significant challenge and reward in a highly progressive team environment.

Our current need requires individuals with 2+ years solid System 38, RPG III/COBOL experience and proficiency in any of the following:

- Technical Consulting
- Design
- Education & Training
- Data Communications
- Project Management
- Product Development

Whittman-Hart offers one of the finest compensation packages in the industry, including high earnings potential, project diversity, incentives, paid insurance coverage, relocation allowance and other impressive benefits. Please send your resume in strict confidence to: **Jared Bobo, Manager of Recruiting, Whittman-Hart, INC., 377 East Butterfield Road, Suite 390, Lombard, IL 60148, (312)971-2270.**

Whittman-Hart
The Leader in the Midrange Solutions.

Equal Opportunity Employer M/F

COMPUTER CAREERS

SOFTWARE PROFESSIONALS

Take A Closer Look At CPU... You'll Like What You See.

Computer People Unlimited is the largest computer software services firm headquartered in the state of Wisconsin. We provide a full spectrum of data processing and engineering software services to the area's best companies.

A consulting career with us can provide you with diversity, stability, exposure to the latest technology and professional growth as well as a competitive salary and outstanding benefits.

Although we have opportunities for professionals in all areas, our highest priority is for individuals with any of the following skills:

TANDEM, TAL, COBOL, PATHWAY, VAX, DB EXPRESS

To take a closer look at CPU and see what opportunities are available for you, contact: Bill Rudd, Dean McMath or Kathi Fowler by calling our toll free number : 1-800-527-8462. Or send your resume to CPU, Dept. CW-1120, 744 N. 4th Street, Milwaukee, WI 53203. No entry level positions available.

We are an equal opportunity employer.

CPU
COMPUTER PEOPLE UNLIMITED INC.

FREE Salary Survey

The **1989 Metropolitan Computer Salary Survey** is a great way to learn more about what's going on with salaries in computing. More than 60 position titles and responsibility levels are reviewed in 54 metropolitan areas across the U.S. and Canada. Included are titles ranging from staff programming and systems analysis levels to top management.

Call 1-800-272-4473, ext. 162

Call anytime 7 days a week for your free copy. Or, write: P.O. Box 7571, Department W91, San Mateo, CA 94403-7571. (If you write to request a copy, please include your position title and home address.)

source edp
Computer Recruiting Specialists

BROWARD COUNTY, FLORIDA
EXEMPT EMPLOYMENT OPPORTUNITY
DIRECTOR INFORMATION
RESOURCE MANAGEMENT DIVISION
$57,927 - $86,311

Broward County (Ft. Lauderdale area) is a rapidly expanding urban area (pop. 1.3M). This position is responsible for data processing, office automation, and telecommunications activities for the 5800 employee County Commission government. The Division also provides support in such matters to elected Constitutional officers including the County Appraiser, Sheriff, Clerk of Court, Elections Supervisor, State Attorney and Public Defender. The function is accomplished with the use of IBM and Unisys mainframe computers and a vast network of PC's, terminals, a..d departmental based mini computers. Telecommunications are operated through both owned and leased networks including an 800 MHz radio system currently being installed.

The position requires graduation from an accredited four (4) year college or university with a major in math, accounting, or public or business administration, supplemented by training in data processing and/or communications, and a minimum of seven (7) years progressively responsible experience in the field of data processing/communications which must have included four (4) years at an administrative/supervisory level; or any equivalent combination of training and experience.

Resume subject to public disclosure in accordance with Florida's Public Records Act. Send resume with complete salary history to arrive not later than 5:00 p.m., December 15, 1989 to:

Personnel Director
Room 508
Governmental Center
115 S. Andrews Avenue
Fort Lauderdale, FL 33301

EQUAL EMPLOYMENT OPPORTUNITY M/F/H/V

SOFTWARE OPPORTUNITIES

1-800-423-5383

Let our National Award winning computer specialists assist you in your search. We have over 300 affiliated offices around the country ready to work for you!

LIFE INSURANCE	To $60K
UNIX INTERNALS	To $60K
SYSTEM 38	To $40K
IDMS, IMS or ADABAS	To $50K
P.A. (COBOL or ALC)	To $40K
UNIX C	To $55K
MVS & VM INTERNALS	$ OPEN
ACF VTAM NCP	To $50K
DB2, SQL	To $60K
COBOL, CICS	To $40K
Software Engineers	To $60K
OVERSEAS	$ OPEN

ROBERT SHIELDS & ASSOCIATES
P.O. Box 890723, Dept. C
Houston, TX 77289-0723
FAX: 713-486-1496

PROGRAMMER ANALYST: Develop software applications using data base design techniques and process control systems using computer aided design and computer aided manufacturing techniques. Maintain and enhance COMETS - the VDI based WIP tracking and engineering data collection system. Interface with users in all departments to develop and implement software systems. Experience or advanced university training with data base design and development, computer aided design and manufacturing and with VAX/VMS and COBOL/PASCAL programming, documentation and testing. Bachelor's or equivalent in Computer Science, Information Systems, Engineering plus 2 years experience as Programmer Analyst, Systems Analyst or Software Engineer. Master's degree or equivalent in Computer Science, Information Systems or Engineering is equivalent to Bachelor's degree plus 2 years. $2,800 per month. Job Site: Rio Rancho, New Mexico. Send resume with a copy of th..s ad to: Job Order #276207, New Mexico Department of Labor, CC 1001, 501 Mountain Road NE, Albuquerque, NM 87102. EOE.

SYSTEM SOFTWARE ENGINEER

Please send resume within 30 days of publication date to:

Employment Security Department
ES Division
ATT: JOB# 0174159-J
Olympia, Washington 98504

JOB DESCRIPTION: Designs, implements and tests complex and high-level systems and software for microcomputers and processors. Works with other engineers to design and test language systems software utilizing OS/2, MS-DOS, XENIX and other multitasking operating systems, "C", Pascal, 86 Assembler Series and BASIC languages. Will work with IBM PC-compatible computers. Designs and implements video graphics and sound generation software for language products. Assumes major project responsibilities including: 1) requirements and analysis of product specifications; 2) product design; and 3) implementation schedules.

REQUIREMENTS: Bachelor's degree in Engineering, Computer Science, Physics or Mathematics; six months work experience in computer design or programming utilizing OS/2 or MS-DOS, XENIX or UNIX, and multitasking operating systems, BASIC, "C", PASCAL and 86 Assembler Series languages; IBM PC-compatible computers; and designing and implementing video graphics and sound generation software.

SALARY: $29,000-$32,000 per annum depending on experience. 40 hours per week, flex time.

Position located in Redmond, Washington.

EOE

Systems Software Engineer responsible for design and development of software applications and tools. Duties include technical computing projects involving all aspects of software systems including operating system internals UNIX (tm), distributed computing, network programming and protocols, software development technologies and graphics. Lead projects focusing on a variety of computing technologies such as CASE and RISC. Consult on internals regarding RISC compiler technology. Conduct technical training on UNIX and C programming. Develop tools to improve software development capabilities and optimization of applications. Duties also include conversion of software between different operating systems, testing, documentation and UNIX shell script development. Assist in integration, conversion, and rewrite of engineering applications. Requirements for this position are: a Master of Science in Computer Science and ability to write UNIX Bourne and C shell scripts; ability to convert software between operating systems; knowledge of UNIX device drivers, UNIX (tm) kernel, utilities and basic operating systems design, NFS, YP, RPC, XDR, database design, compiler construction, Local Area Networks (LAN), communication protocols TCP/IP, OSI, TELNET, SMTP, interactive computer graphics, and Programming in C, Pascal, Fortran, and Lisp. Salary: $35,006 to $38,000 per year. 40 hrs/wk. 8:15-5pm. No exp. req. If you are interested in, and qualified for the above position, please forward your resume to: Attention: Job Order #00063, Massachusetts Department of Employment and Training, Special Programs Unit, Charles F. Hurley Building, 19 Staniford Street, Government Center, Boston, MA 02114.

MVS SYSTEMS PROGRAMMER

St. Louis based service organization has immediate need for an MVS Systems Programmer. Your 2+ years of experience in supporting MVS and CICS along with a knowledge of Assembler Language will enable you to be considered for this position. Excellent Benefits. Salary to $44,000.

ROBERT HALF
DATA PROCESSING
7733 Forsyth Blvd.
St. Louis, MO 63105
(314) 727-1535
FAX: (314) 727-1321

Programmer Analyst

Southern Baptist Hospital's Information Systems Department is seeking a Programmer Analyst with experience in COBOL, VM/DOS, CICS and VSAM. This position is responsible for the analysis, design, coding, testing and documentation of application programs. The preferred candidate will have at least two years experience and a bachelor's degree. Send resume and salary history to:

Southern Baptist Hospital
Human Resources
2700 Napoleon Avenue
New Orleans, LA 70115
Mon.-Thurs., 9am-12noon

EOE/M/F/H

Research Programmer/Developmant Staff. Location: Supercomputer Consulting Firm. Programmer specializing in code translation for optimizing compilers for supercomputers. Monday through Friday, 8:00 a.m. to 5:00 p.m., 40 hours per week, salary ~$36,000 per year.

Duties: Develop and maintain source-to-source preprocessors and compilers for vector, array and multi-processor machines. Design and implement in the "EYE" language, compiler algorithms to enable Fortran and C programs to achieve optimal performance on vector and parallel machines. Speed up analysis of large Fortran and C programs; identifying hot spots and developing faster time and space efficient algorithms. Analyze a broad range of computer and compiler architectures and adapt company technology to solve end-user requirements. Effective interaction with customers as required.

Minimum Qualifications: Graduate coursework must include: Advanced Software Engineering, Advanced Systems Programming, Architecture of parallel and vector computers. Must have courses in Data Structures, Numerical Analysis and Artificial Intelligence.

Please send: resume, transcript of all courses, 3 letters of referral, current visa status, and date available for employment to Ms. Helen Vedder, Illinois Department of Employment Securities, 1008 W. University Avenue, Urbana, IL 61801, Reference No. 9937.

This is an Employer Paid Ad.

Systems Analyst for firm in N.E. Ohio for designing, developing and implementing software systems for manufacturing firms, with special emphasis on creating LAN (local area networks) capable of integrating a firm's computers into one coherent system. Involves use of COBOL, Oracle, and C computer programming languages. Implementing and administering computer systems using the VAX/VMS operating system. Must have M.S. in Computer Science and academic program must have included one course each in: Computer Networks, Computer Architecture, Data Structure, and Artificial Intelligence. No experience required in above duties but must have 2 years of general experience as a systems analyst. Must have the ability, either from academic coursework or professional experience, to design and operate Local Area Networks (LAN) to use the VAX/VMS operating system and Novell Netware API (Application Programming Interface) and to write programs in COBOL Oracle, Databus and C: this ability to be evidenced by letter(s) from academic advisor(s), and/or publications (including dissertation, if appropriate) and/or testimonial(s) from employer(s). 40 hrs/wk, 8am-5pm, Mon-Fri, $36,000/yr. Send resume and course transcript (NO CALLS) to G. Maugans, JO# 1084484, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, Ohio 43216.

SYSTEMS ANALYST

Bowling Green State University is seeking individuals with IBM OS/MVS, CICS, and COBOL experience to fill 2 Systems Analyst positions. Candidates must have a minimum of 4 years of relevant data processing experience; prefer at least 1 year of analysis experience and a Bachelor's Degree. Progressive technical environment will utilize analyst skills both for in-house development and implementation of state-of-the-art packages. Salary $32,000 to $38,000 depending on qualifications. Letter of intent, resume, salary history, and references must be postmarked no later than December 1, 1989 to:

AnnMarie Heidt
Personnel Support Services
100 College Park
Bowling Green State University
Bowling Green, Ohio 43403

Minorities and females are encouraged to apply.

Medical Instrumentation Systems Analyst, 40 hrs/wk. 8:00a.m.-5:00p.m. $47,840/yr. Design/develop software tools to process raw data and images generated by Nuclear Magnetic Resonance (NMR) scanning process. Duties include: generation of design documents, redesign/conversion and testing of implementation tools; writing of communication drivers; design/implementation of remote procedure calls; quality control. Tools: UNIX/SUN with C and objective C; Fortran; TCP/IP primitives; DG Eclipse. Master of Science in Computer Science as well as 2 yrs. experience as a Medical Instrumentation Systems Analyst or as a Software Engineer. Graduate coursework must include: Data Communications and Networks; Object-oriented programming. Previous experience must include six months work with C and UNIX. Send resumes to: Mr. Gil Martinez, Waukesha Job Service Office, 141 North West Barstow, Waukesha, Wisconsin 53188, Reference #0379098.

Computerworld Recruitment Advertising Works.

"We'll be running a regular recruitment advertising schedule in Computerworld to get the results we need."

— Steven Tully
President
Brannon & Tully, Inc.

A custom software development company in Norcross, GA, Brannon & Tully, Inc. provides contract programing/consulting services to a diverse client base of Fortune 500 companies, utilities, and communications companies. President Steven Tully knows that building a staff of experienced professionals is key to the company's ongoing success in developing solutions-based software for specific applications.

"Because our recruitment advertising plays a vital role in finding the seasoned professionals Brannon & Tully needs, we have to expect one thing. Results. That's why Computerworld *is the only trade publication we use for recruitment advertising.*

"Of the over 50 professionals we hired in the past 18 months, over one-third came from Computerworld's *pool of qualified readers. At our present growth rate, we're expecting to double our size in the next 18 months. That means we'll be looking to augment our staff with more and more industry, applications, software, and programming experts to meet the growing demand for greater project diversification.*

"With Computerworld, *we know our ads get read by a very large audience of seasoned IS professionals. Because these professionals are not industry or hardware specific, we get a larger base of qualified professionals to choose from. We also get national reach. In fact, within the last six months alone, we recruited two candidates who moved all the way from California to the Atlanta area.*

"In other words, recruitment advertising in Computerworld *draws bigger numbers.*

Computerworld. We're helping serious employers and qualified information systems, communications, and PC professionals get together in the computer community. Every week. Just ask Steven Tully. For all the facts on how *Computerworld* can put you in touch with qualified personnel, call your local *Computerworld* Recruitment Advertising Representative today.

COMPUTERWORLD

The weekly newspaper of record for computer professionals.

Boston: 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700
New York: Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 967-1350
Washington D.C.: 8304 Professional Hill Drive, Fairfax, VA 22031 (703) 573-4115
Chicago: 10400 West Higgins Road, Suite 300, Rosemont, IL 60018 (708) 827-4433
Los Angeles: 18008 Sky Park Circle, Suite 145, Irvine, CA 92714 (714) 250-0164
San Francisco: 18008 Sky Park Circle, Suite 145, Irvine, CA 92714 (714) 250-0164

An IDG Communications Newspaper

Computer

Opportunities at the Supercomputer Center

The Minnesota Supercomputer Center, Inc., a University of Minnesota affiliate, provides leading edge supercomputing services to academic, government, and industrial researchers from around the country. At our state-of-the-art facility, located on the edge of downtown Minneapolis near the University, we currently operate a hardware platform consisting of two UNIX-based supercomputers, a CRAY-2 and an X-MP. We have immediate openings for:

User Services Representative

Responsible for in-depth consulting for MSC resource users. Requires a bachelor's degree in mathematics, science, engineering, or computer science, and a solid base of experience: five years of programming (preferably with three years in a large-scale computing environment), three years of UNIX, some FORTRAN and C, plus two other programming languages and two other operating systems, and two years of consulting, teaching, or other technical support.

Systems Programmer

Responsible for direct systems programming and some applications programming support for parallel architecture systems users. Requires bachelor's degree in computer science, mathematics, science, or engineering and, preferably, experience in parallel processor programming in a large-scale scientific computing environment. Background must include five years of programming, one year of UNIX, and two years of work with at least two programming languages. We also prefer work experience with a Connection Machine or other massively parallel architecture.

Communications Programmer

Responsible for supercomputer and peripheral equipment administration and communications software maintenance, for monitoring and troubleshooting system, network, and support equipment condition and performance, and for software tool development to automate or increase these capabilities. This assignment includes integration of our existing systems with parallel architecture systems from multiple vendors. Requires bachelor's degree in computer science or five years of experience in computer or network programming/administration. UNIX operating system and TCP/IP experience is a must, large-scale computing environment and supercomputers preferred.

MSC offers qualified candidates the opportunity to work in a highly advanced environment with a competitive compensation package. To apply in confidence, please send your resume to:

Director of Administration

Minnesota Supercomputer Center, Inc.

1200 Washington Avenue South
Minneapolis, MN 55415

MSC is an equal opportunity employer/contractor
UNIX is a registered trademark of AT&T
CRAY-2 and X-MP is a trademark of Cray Research, Inc.

FLORIDA

Your Chance To

* **Expand Technical Skills**
* **Accelerate Career Path**
* **Improve Lifestyle**

PA UNISYS COBOL IPS	33K
PA HP3000 - SPEEDWARE	40K
PA 4680 POS	38K
PA DB2 SQL	42K
PA SYS 38 AS400 RPG	42K
PA IDMS ADSO	45K
PA Telephone Billing	36K
PA CIM	39K
PA CICS PERSONNEL	45K
PA IMS DB/DC	42K
PA VAX COBOL ORACLE	32K
SE ADA VMS	43K
Sys Prog Tandem	48K
PA INFORMIX C	40K

Many Other Permanent and Contract Positions Local and Nationwide

COMPUTERPEOPLE

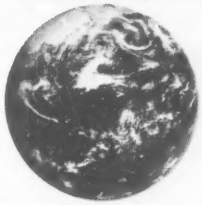
12225 28th St., North
St. Petersburg, FL 33716
813-573-2626

2005 W. Cypress Creek Rd.
Suite 3
Ft. Lauderdale, FL 33309
800-777-8803 or
305-771-8803

20 North Orange Ave.
Suite 1400
Orlando, FL 32801
800-888-1064

ENGINEERING

The Ultimate Large Scale Environment



Since 1961, Litton Computer Services (LCS) has applied large scale computer and software technology to a variety of DoD projects—from comprehensive logistics management to sophisticated satellite command and control. If your experience is in large scale environments, consider putting your talents to work in our **Northern California** or **Dayton, Ohio** locations.

The Reliability and Maintainability Information System now under development by LCS for the U.S. Air Force is expanding following successful completion of Phase I. Phase II and III, to be developed concurrently, require additional personnel in the following area:

Tandem Software Professionals
Northern California
Dayton, Ohio

Using your strong background in software development, you will support the integration of software into a functioning system and prepare technical documentation including design, test and "as built" specifications. This includes analyzing functional requirements and design—with software to match—as well as coding and unit testing software modules to comply with design specifications.

Requirements include at least 4 years of software development experience—the majority of which should be in Tandem equipment. A demonstrated knowledge of COBOL, SCOBOL, Pathway and other Tandem development aids is necessary. Work experience in the development of Tandem Requesters and Servers is desirable, as is experience in relational database design—particularly Tandem Non-Stop SQL.

For openings in Northern California, please send your resume and salary history to: Litton Computer Services, Attn: Kim Bermuda, 1300 Villa St., P.O. Box 7113, Mountain View, CA 94039-7113.

For Dayton, Ohio openings, please send your resume and salary history to: Litton Computer Services, Human Resources, Attn: Dave Barnhart, 4020 Executive Drive, Beavercreek, OH 45430. We are an equal opportunity affirmative action employer. U.S. citizenship is required.

The *People* in the Ultimate Large Scale Environment.

Litton
Computer Services

Big 8

EIS Comshare Professionals $30,000 - $70,000+

Join the exciting field of consulting with a prestigious "BIG EIGHT" firm. Top salaries and benefits are available in most major cities. RUSH resume to:

Donald C. Thomas & Associates, Inc.
1410 N. Westshore Blvd. #806
Tampa, Florida 33607
Specialized IBM Personnel Services

CA & AZ CONTRACTS

CONSULTANTS WANTED

P. Murphy & Associates, Inc.

4405 RIVERSIDE DRIVE, SUITE 100
BURBANK, CA 91505
(818) 841-2002 (714) 552-0506
FAX: (818) 841-2122

Senior Systems Programmer/Team Leader responsible for overseeing current and future product development strategies; acting as team leader for the planning and programming of an IBM OS/2 project involving the conversion of company's existing database management product to the new OS/2 operating system; modifying existing database to conform with OS/2 features such as graphical user interface, multitasking environment, memory management system, interprocess communication facility, direct device access, file locking and networking, directing and coordinating the training activities of team members to facilitate the implementation of OS/2 project; rewriting concurrency subsystem for all product lines for greater efficiency and accommodation of greater volumes of transaction requests; interfacing existing database with LAN (local area network) communication protocols such as Novell, 3-COM, IBM Token Ring, Microsoft LAN Manager, SUN Network File System, as well as others yet to be identified, to support a wide range of hardware and communications environments; overseeing and troubleshooting the implementation of all LAN conversions for maximum efficiency. No specific education required. Must have 6 years experience in job offered or 6 years experience as Systems Analyst. Experience as Senior Systems Programmer/Team Leader or Systems Analyst must have involved development of Multi-user, concurrent and interactive systems for project-tracking as well as program conversion to PRIME and Control Data Corp., (CDC) computers. This experience must have included system installation, customer training and support. Applicants must have had one course in each of the following: 1. Design Techniques; 2. Considerations in file organization; 3. Compilers structure; 4. Operating Systems; 5. Assembler language/Macros. 40 hours M/F, 9:00-5:00p.m., $50,500 per annum. Send resume to Illinois Department of Employment Security, 401 S. State St., 3 South, Chicago, Illinois 60605. Attention: Mr. Robert Felton. Ref.# V-IL 9493-F. An Employer Paid Ad.

RSVP SERVICES

ANALYSTS, PROGRAMMERS, DESIGNERS

If You Have The Right Stuff . . .

2 years minimum professional experience, stable work history, good technical references, U.S. citizenship or green card, and competence in at least one of the following:

• UNIX/C • VAX/VMS • IBM MVS • AS/400
• System/38 • Tandem • Ada • RPG III • DB2
• SQL • IDMS-ADS/O • IMS • CICS • ORACLE
• INFORMIX • SYBASE • PACBASE • FOCUS
• INGRES • ADABAS • SNA • VTAM • M&D • MSA
• MAPICS

• Communications • Networking • Operating Systems
• Compilers • Controls • Parallel Processing
• Distributed Systems • Object Oriented Programming
• Windowing • DB Development *OR* Administration
• SQA/IV&V *OR* CM • ASW/Sonar • Radar
• Supercomputing • CASE • Expert Systems
• Circuit Simulation • Microprocessors

. . . We Have the Right Service

Thousands of placements of computer professionals since 1966: over 1000 client companies and 200 affiliates nationwide; resume preparation and selective distribution: no cost or obligation to you; no sales pressure.

TO APPLY: Mail or FAX resume or call Howard Levin.

RSVP SERVICES
Dept. C, Suite 614, One Cherry Hill Mall, Cherry Hill, NJ 08002
800-222-0153 or FAX: 609-667-2606 (refer to Dept. C)

HP3000 GULF COAST

Mfg. co. has doubled in last 2 years and plans to double in the next 2. Seeking motivated COBOL programmer with 3-5 years exp. in accounting and/or mfg. applications. Need leadership ability for mgmt. duties/promotion. Reloc. paid. To $40k Fee Pd. For info on this and other Nat'l positions please call:

ROBERT HALF
6243 IH 10 West #850
San Antonio, TX 78201
1-800-531-5402

COMPUTER PROFESSIONALS

The Space Telescope Science Institute (ST ScI) offers you the opportunity to contribute to one of the greatest scientific enterprises of the decade. An international center for research in astronomy, we are responsible for the scientific operations and systems support of the Hubble Space Telescope. The following opportunities exist in Information Systems Development at the Institute:

System Programmers

You will be a key team member performing software design, development and integration tasks and developing portable systems that can operate in a distributed multi-user, multi-vendor environment. The major team project is the development of the optical disk data archive and observation catalog for Hubble Space Telescope data. This system supports VAX and UNIX client workstations in a local area network, and remote catalog access via wide area networks.

Candidates should possess BS degree or equivalent with a minimum of five years experience in related programming activities with experience in C, UNIX, VMS, networking technology and distributed systems development. Prior experience in a closely related scientific or technical field utilizing workstations and LAN technology will be considered.

Network Specialist

You will provide ISO coordination and support of wide-area networking (TCP/IP, DECnet). Goals include management of gateway, network, and communication links to the Institute and technical support to other astronomy institutions, as well as analysis of network performance and site security.

Candidates should possess BS degree with three to five years in a related technical field with two to three years in wide-area and local area network management and planning. Knowledge of the specific network protocols and through familiarity with issues of site and network security as well as UNIX and VMS are required. Programming skills in C, DEC, and UNIX shell scripts are required. Ability to do hardware and software evaluations.

ST ScI, placed in a university setting, offers competitive salaries and excellent benefits. Females and minorities are strongly urged to apply. Candidates should forward resume and salary requirements to:

SPACE TELESCOPE SCIENCE INSTITUTE

SPACE TELESCOPE SCIENCE INSTITUTE
Personnel Office
3700 San Martin Drive
Baltimore, Maryland 21218
EEO/AA

PROGRAMMER

A 59-store food company in TN and North GA is seeking a programmer with at least 5 years experience programming IBM mainframe computers using COBOL and CICS. Experience managing DP projects is desirable, and a working knowledge of the grocery industry. Experience with financial packages is desirable, particularly McCormack & Dodge. To apply, send resume and salary history to:

RED FOOD STORES, INC.
Human Resources Department
P.O. Box 22008
Chattanooga, TN 37422

PROGRAMMER ANALYSTS

We need several Programmers and Programmer/Analysts with experience in IMS DB/DC, COBOL and OS/UCL for clients in the Carolina's. Salaries range from $30K - $45K depending on experience. We also need IDMS, ADS/O, DB2, ADABAS/NATURAL, DEC/VAX, ORACLE, INGRES and RdB experienced people throughout the S/E. Salaries range from $30K - $50K with mfg., insurance, banking, distribution, and consulting companies. Contact

JIM BOSTIC,
PHILLIPS RESOURCE GROUP
P.O. Box 5664
Greenville, SC 29606
or call **803/271-8350 days**
803/292-1181 evenings
or FAX **803/271-8469**

Manager Of Network Support

Northwestern Technologies Group
A Joint Venture of Northwestern University and Northwestern Memorial Hospital

Work in a creative atmosphere within a dynamic and rapidly growing private communications company. Join a sophisticated technological environment which responds to an exciting customer base.

Responsibilities include:

- Leading a team assembled from computing and communications units that supports the operation and effective functioning of a multi-campus backbone network
- Interfacing with regional and national network control centers and service providers
- Planning, designing, analyzing and evaluating complex data networks
- Researching future communications and network management technologies
- Providing sophisticated customers with networking solutions

Qualifications:

- B.S. degree (M.S. preferred) in telecommunications, computer science or engineering
- Some experience in the industry with emphasis on network systems analysis and project management
- Knowledge of network protocols (OSI model, TCP/IP, 802.3 in particular), standards, and computer hardware and software concepts
- Experience with the UNIX operating system and its networking utilities and the UNIX BSD networking suite

Please send your resume to:

Human Resource Administration
Department 1806

Northwestern University
720 University Place
Evanston, IL 60208-1142

EEO/AA Employer. Employment eligibility verification required upon hire.

Western Nebraska Community College, Scottsbluff Campus, is currently accepting applications for the following positions for IBM system installation in its Strengthening Institutions grant. The Strengthening Institutions grant is a 5-year U.S.D.E supported project that commenced October 1, 1989.

POSITION: (1 VACANCY)
SYSTEMS ANALYST

RESPONSIBILITIES: Design and assist in design of appropriate management information system (MIS) and serve as liaison between programming staff and institutional users.

QUALIFICATIONS: 5 years experience in RPG III, Data Base, Online Programming, MIS background, and leadership ability.

POSITION: (2 VACANCIES)
PROGRAMMER

RESPONSIBILITIES: Develop and assist in development of adequate and appropriate programming for MIS.

QUALIFICATIONS: 1 year experience in RPG III, Data Base, Online Programming, and MIS.

SALARIES: Commensurate with background and experience.

START DATES: Immediate.

APPLICATION DEADLINE: December 4, 1989.

APPLICATION PROCEDURE: Send: Letter of application, Current resume, Academic transcripts, 3 letters of reference.

TO: Personnel Office, Western Nebraska Community College, 1601 East 27th Street, Scottsbluff, NE 69361.

EEO/AFFIRMATIVE ACTION EMPLOYER

SYSTEMS ANALYST

We have a position available for an experienced systems analyst to provide technical expertise for the analysis, design, implementation, and integration of software systems at the project level.

The position requires a BS/BA in Computer Science, a minimum of two years experience in a structured design and analysis environment, excellent written/verbal communication skills, experience and thorough knowledge of PC systems and applications, and the ability to be a leader.

Our compensation and benefit package is very competitive, and includes an annual bonus and a 401(K) plan.

If this position looks like the one you have been searching for, please send your resume and salary requirements to:

CW-17992
Computerworld
Box 9171
Framingham, MA 01701-9171

A Terrific Opportunity

Computer Consulting Group, one of the Southeast's fastest growing contract programming and consulting firms, has immediate openings for talented Programmer-/Analysts with 2 or more years experience. Excellent salary & benefits package. We're especially seeking:

DEC/VAX/FORTRAN
VAX/RDB
UNIX/C
IBM DB/DC
DEC/ADABAS/RPG
COBOL/CICS
IDMS/ADSO/
CULLINET
INTERGRAPH
MICROSTATION
ADABAS/NATURAL
VAX SYS-9000
WANG COBOL
AS 400/COBOL
DEC SYS PROG
TECH WRITER/PC
HP 9400/C/ABBSY

Computer Consulting Group
Contract Professional Services

Research Triangle Area
4109 Wake Forest Rd.
Suite 307
Raleigh, NC 27609
1-800-222-1273
(803)738-1994
FAX (803)738-9123

DB2
DATA BASE ADMINISTRATOR

Large oil and gas company seeks individual with strong DB2 data base administration background. PL/1 or COBOL is required, TSO/ISPF and IMS DB/DC would be desirable. Salary negotiable. Fee paid.

ORACLE
SENIOR ANALYST

Take charge person needed immediately to develop financial applications in SQL. 2+ years of experience with relational database required.

SENIOR
DATA BASE ADMINISTRATOR

Leadership position with international firm. 3 years minimum experience with ORACLE or DB2. To 50K.

TECHNICAL SUPPORT

Local software firm needs technical support personnel. Heavy user interaction. Excellent communications skills required. Programming background a plus. To 35K.

ROBERT HALF

1360 Post Oak Blvd.
Houston, TX 77056
(800-366-1994

PAR

CONTRACTORS

Min. 2 years experience:

- NOMAD
- C, UNIX
- ORACLE
- TELON, DB2
- X-WINDOWS
- AS400, PM-38
- SUPRA, MANTIS
- M&D, MILLINIUM
- ISI PAYROLL

Please call, fax or mail resume to:

PAR, INC.
3100 Monticello, Suite 606
Dallas, TX 75205
(214) 841-3111

OR

PAR, INC.
4615 S.W. Fwy, Suite 400
Houston, TX 77027
(713) 622-3711
FAX (713) 622-3778

TRY OUR
24 HOUR
ON LINE DP
JOB LISTINGS

CALL
919-222-0979

DP RESOURCES, INC.
P O Box 5057
Burlington, NC 27216-5057

SYSTEMS ENGINEER/ANALYST wanted. Duties: Generally analyzing clients' data processing requirements & computer hardware then designing, developing & implementing a computer system which will process the client's data in the most timely & inexpensive manner on that hardware. Specific duties will include maintenance & development of a financial applications system on an IBM 3090 computer primarily using COBOL language but also using the following software & languages: MVS/XA, TSO/ISPF, VM/CMS, IMS DB/DC, PL/1, JCL, FOCUS 4GL & Utilities. Need Bachelor's in Computer Science or Engineering & two years exp in the job offered or two years exp as Systems Analyst, Assistant Systems Analyst, Programmer Analyst, Programmer. One year of the related experience must involve designing & developing software using an IBM 3090 computer & COBOL language. Four months of the related experience must involve using the following software & languages: MVS/XA, TSO/ISPF, VM/CMS, IMS DB/DC, JCL, FOCUS 4GL &Utilities. Pay is $36,000/yr. 40 hr/wk. Resumes to 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Ref. #53289. Employer Paid Ad.

PROGRAMMER/ANALYSTS
& SYSTEMS PROGRAMMERS

FOR CAROLINAS
AND SOUTHEAST

We have opportunities for on-line and database programmers for both in-house and consulting positions. Fee Paid. Please call or send resume to:

Keith Reichle, CPC
Systems Search, Inc.
203 Heritage Park
Lake Wylie, S.C. 29710
803/831-2129

(Local to Charlotte, NC)

PROGRAMMER/
ANALYST POSITIONS
SYSTEMS PROGRAMMERS
(UP TO $50,000)

With at least 3 years experience in

- IMS DB/DC, DL1
- CICS
- NATURAL
- ADABASE
- PL1
- COBOL
- DB2/SQL
- ORACLE
- VM/MVS
- RPGII/III
- VAX/VMS
- IDMS/ADS/O
- FOCUS
- C LANGUAGE

Please Send Resume in Confidence to:

MSI **Management Solutions, Inc.**
1416 South Third Street,
Louisville, KY 40208

Information technology professionals Benson & Douglas, a national consulting firm, has career opportunities for the following professionals:

- ORACLE, INFORMIX, INGRES, DB2
- DEC/VAX, ALL SOFTWARE PLATFORMS
- HP 3000 & 9000, ALL SOFTWARE PLATFORMS
- UNIX-C
- IBM MAINFRAME, ALL SOFTWARE PLATFORMS
- CASE TOOLS, NETWORKING

At B&D we offer Maj Med, Dental, Life, Pd Holidays & Vacations for our employees. For immediate consideration please call B&D, 919-544-7977 or 800-525-2927, or send resume to: **B&D, P.O. Box 1297, Apex, NC 27502.**

Computer Systems Analyst wanted to analyze complex systems requirements; and, design, develop and implement financial systems software including payroll, banking and special modules for deposits accounting using multihardware, IBM mainframes under MVS and UNISYS large systems B5900, B6900, A Series and UNIVAC 1100; Requires M.S. degree in Mechanical Engineering, Computer Science or Computer Engineering and one year experience in the job offered or one year related experience as a Computer Software Engineer; $44,000.00 per year; 40 hours per week. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref. #77389 "Employer Paid Ad"

Every week Computerworld delivers more qualified job candidates than any other newspaper.

That's why more companies place more recruitment advertising in *Computerworld* than in any other specialized business newspaper.

To place your ad, call Lisa McGrath today at 800-343-6474 (in MA, 508-879-0700).

COMPUTER CAREERS
Planning your way to the top
COMPUTERWORLD
INSIDE
Booster shots for 3B minis
IBM fires up 3390 performance
IMS gateway precursor to peer-to-peer access
It's where you work — and for whom

Weekly. Regional. National. And it works.

An IDG Communications Publication

DIRECTOR, MANAGEMENT INFORMATION SYSTEMS

Knowledgeware, Inc., the number one CASE software vendor in the world, has an immediate opening for a Director of Management Information Systems, reporting to corporate management.

The responsibilities include the following:

- Assist each business unit to determine data processing application needs, and coordinate these plans into a Company wide plan for management information systems.
- Provide assistance to all business units in selecting applications, technologies and procedures.
- Provide support for planning, analysis, design and construction of information systems.
- Prepare departmental business plan and budget.

The ideal candidate will have a minimum of 5 years systems and business experience in an IBM environment.

Please send your resume and salary requirements in confidence to:

Diane J. Braglia
Knowledgeware, Inc.
Suite 1100
3340 Peachtree Road, N.E.
Atlanta, GA 30326

Equal Opportunity Employer M/F/H/V

KnowledgeWare®

The Facts: Pure & Simple

1. **USAA total assets top $14 billion**
2. **The USAA organization includes 35 subsidiaries, 19 affiliates, and 25-plus satellite offices**
3. **USAA employees now number 11,000**
4. **USAA is the nation's largest mail order business in terms of sales and volume**
5. **USAA is one of San Antonio's largest private employers**
6. **Forbes calls USAA "A place where the financial supermarket—a one-stop shop for everything from stocks to life insurance—really works."**

FACT IS, USAA is a very impressive organization, and we're very proud of our achievements. Our goals for the future are no less impressive: We plan for more of the same—success that results from a dedication to quality in products and services through employees who share our commitment to excellence. If you're interested in joining a company where the facts tell the real story, consider these current opportunities:

PROGRAMMER ANALYST/ SYSTEMS ANALYST

Opportunities exist for individuals possessing one or more of the following skills:

- Strong analytical, technical and interpersonal skills
- Applications experience in areas such as: Financial, General Ledger, Accounting, Loss Reserves
- Proven development expertise in a "Team Concept Approach"
- CASE and Application Development Productivity Tools
- PRIME experience in the Telecommunications arena
- Proven experience in: IBM mainframe environment—3090, MVS /XA, TSO, IMS, DB2, ISPF, PS2, PL1, COBOL, EASYTRIEVE, CICS

CLAIMS SYSTEMS PROGRAMMER ANALYST/ SYSTEMS ANALYST

Requires 3-5 years Property & Casualty Claims insurance applications with a strong background in large system development in the following areas:

- IBM mainframe environment—3090, MVS/XA, TSO, IMS, DB2, ISPF, PL1, COBOL, EASYTRIEVE
- Systems analysis skills to include use of structured methodology, writing specifications, design and analysis, and user interface.

Qualified candidates please send resume to:

USAA
USAA Building
San Antonio, Texas 78288-0055
Attn: Employment & Placement/ SD/TLL/CW 1120

USAA

An Equal Opportunity Employer, M/F. Principals only, please.

M A Y O

MAYO CLINIC. WHERE MANY SPECIALISTS SHARE A SINGLE GOAL.

At the Mayo Clinic, our focus is clear. Joining us in an IBM 3090 CPU environment means you can have a viable influence on our progress in health care. We now have challenging opportunities in the following areas:

DATA BASE ADMINISTRATOR

- Minimum 2-3 years data base administration experience, including:
  - DB2; additional experience with Cullinet's IDMS/R and/or Cincom's SUPRA a plus.
  - Physical design and implementation of data base applications.
  - Data base system software installation and maintenance.
  - Data base systems and application performance monitoring and tuning.

DATA COMMUNICATIONS SYSTEMS PROGRAMMER

- 1-3 years experience in CICS systems programming or 3-5 years in CICS applications.
- MVS, VSE, VTAM, and SMP experience preferred.
- Bachelor's degree in computer science or mathematics required.

Combining health care, education and research in an environment of innovative collaboration, the Mayo Clinic offers opportunity for distinguished career growth. We also provide an exceptional compensation package, including a generous personal security and benefits program. For confidential consideration, please forward resume with earnings history, available transcripts and credentials to: **Mr. Mike Schryver, Personnel Section, Mayo Clinic, 200 First St. S.W., Rochester, MN 55905.** Mayo is an Equal Opportunity Employer.

mayo

C L I N I C

Data Processing

VAX/VMS and UNIX

Make a change in your career and your lifestyle with **Digital Systems Consultants, Inc.** DSC is the leading VAX/VMS and UNIX Software Services Company in the Midwest. St. Louis is ranked "One of the Eight Best Places to Live" by Rand McNally, and "Most Affordable" by Lomas & Nettleton. With all this in our favor, including a comprehensive relocation package, isn't it time you made a change to **DSC**!

THE DSC PHILOSOPHY

DSC is committed to providing an exceptional level of service to our clients by investing in the support and career development of our employees.

YOU CAN JOIN THE DSC TEAM

Due to continued growth, **DSC** is looking for individuals to add to our permanent staff. We need strong software development skills, 2+ years VAX/VMS or UNIX experience and an in depth knowledge of at least one of the following:

- Ada
- C
- VAX COBOL
- FORTRAN
- Pascal
- ALL-IN-1
- DECnet
- RALLY
- VAX FMS
- Datatrieve
- FOCUS
- ORACLE
- Powerhouse
- PCSA
- TEAMDATA
- DECwindows
- SYBASE
- VAX CMS
- VAX Rdb/VMS
- Networking
- Systems Management

DSC provides continual support and training for your career development, plus excellent benefits and bonus programs in recognition of your efforts and achievements. You owe it to yourself to make a difference in your career that will last a lifetime. To become a member of the **DSC** team, please forward your resume in confidence to: **Digital Systems Consultants, Inc., Dept. CD1120, 12125 Woodcrest Executive Drive, Suite 140, St. Louis, MO 63141. FAX (314) 469-0405. Or call Michelle at (314) 469-7900.**

DSC *Digital Systems Consultants, Inc.*
"VAX/VMS and UNIX Software Services"

We are an Equal Opportunity Employer. U.S. Citizenship may be required.

Computer Software Engineer wanted to analyze complex textile software requirements; and design and develop high quality 3D graphic rendering software for 3D CAD systems to produce high quality texture mapped, anti-aliased images at any desired resolution including soft shadows, environmental mapping and ray tracing; requires M.S. degree in Computer Science or Computer Information Science and Master's degree level courses, one each in Introduction to 3D Image Generation, Computer Graphics, Advanced 3D Image Generation, and Introduction to Interactive Graphics; $34,000.00 per year; 40 hours per week. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref. #76299 "Employer Paid Ad"

COMPUTER PROGRESS CORPORATION
$40,000 to $80,000

We provide Fortune 500 companies with consulting and programming services. We have immediate positions available for Programmers and Analysts in Kentucky, Ohio, Indiana, and Tennessee with one of the following skills.

NATURAL
ADABAS

Send resume or call:
Computer Progress Corp.
12730 Townepark Way
Louisville, KY 40243
(502) 245-8533

SENIOR SYSTEM ENGINEERS

Two positions open in Ohio for industrious individuals with VTAM and NCP experience. Generous compensation including complete benefits package.

PROGRAMMER/ANALYSTS

Immediate openings in Ohio, Michigan and Indiana for Programmer/Analysts with ANY of the following skills: DEC/VAX, SYSTEM 36, AS/400, PICK, COBOL, CICS, DL/1, IMS DB/DC. Paid overtime and benefits are offered. Send resume to Gayle Conrad at:

AZTEC
COMPUTER SERVICES, INC.
P.O. Box 341
Perrysburg, Ohio 43551

MANAGER - CORPORATE INFORMATION SYSTEMS

Louisiana Power & Light Company (LP&L), a progressive member of the Middle South Electric System, is currently seeking candidates for the position of **Manager, Corporate Information Systems** located in New Orleans, LA. This position has the responsibility to develop and implement the overall corporate IS strategy including business plan and system architecture. Requirements include a Computer Science degree or equivalent training and experience plus at least 7 years in IS and project management.

Be part of the change and excitement taking place at LP&L and as lagniappe come enjoy the fun and intrigue of old New Orleans living. LP&L offers an excellent salary and benefits package plus relocation assistance. For consideration, submit your resume with salary history in confidence to: **W.J. Marchese, LP&L, P.O. Box 60340, New Orleans, LA 70160.** An equal opportunity employer.

PROGRAMMER/ANALYST (VAX)

Our information systems department is growing! We are looking for an experienced Programmer/Analyst who can help us continue our growth. If you know the VAX-VMS system, if you work in COBOL, if you have worked with micro-computer and networking systems, have experience in project analysis and design, and you have excellent user interface skills, then we want to talk to you about this opportunity to join our dynamic yet stable company. This is a terrific opportunity with a great company that offers a competitive compensation and benefit package that includes an annual bonus and a 401(K) plan. We hope to fill this position immediately, so don't delay. Send your resume and salary requirements today to:

CW-17993
Computerworld
Box 9171
Framingham, MA 01701-9171

PROGRAMMER OR PROGRAMMER/ANALYST HP SYSTEM

Large, progressive manufacturing firm is seeking a qualified individual who is interested in a challenging position as a member of our data processing project team.

Applicants must have equivalent of a bachelor's degree in computer science, engineering, or business administration; at least 2 years data processing experience on HP 3000 Computer System and knowledge of COBOL language; good written communication and listening skills. Knowledge of POWERHOUSE and PROTOS language would be a plus.

Company offers excellent benefits and competitive salary, relocation assistance. Send resume with salary requirements to:

Personnel Department
Queens Group Indiana, Inc.
620 S. Belmont Avenue
Indianapolis, IN 46221-6069

DP SW CONSULTANTS

Adabas Natural - oppty. to learn DB2
MVS/CICS Systems Programmers
SQL/DS...DB2...CSP
OS/2 Presentation Mgr.
PC Cobol - Florida
ULTRIX/C Windows
ORACLE...INGRES...SYBASE
Pick OS Expert
MSA G.L./H.R. consultants etc. career opptys.

Please contact:

The Registry

THE REGISTRY
National Division
8260 Greensboro Drive
McLean, VA 22102

1-800-367-8115
FAX (703) 790-5497

DATA PROCESSING SUPERVISOR/ SYSTEMS ANALYST

The Village of Niles is seeking a motivated person to serve as Data Processing Supervisor/System Analyst. This is a hands-on supervisory position involved in systems analysis, supervision of one programmer, and overseeing the daily operations of the Data Processing Division of the Finance Department, working in a Wang VS 100 and PC environment.

Responsibilities include: Systems analysis, enhancement, development and design for seven departments, overseeing the computer center, and coordinating the Village's data processing functions and telecommunications network.

Requires a bachelor's degree in data processing-related field, knowledge of COBOL, Wang VS systems and systems analysis, and supervisory experience. Salary commensurate with experience (30K range).

Apply by December 4, 1989, to John Coakley, Assistant to the Manager, Village of Niles, 7601 Milwaukee Ave., Niles, IL 60648.

Niles is an equal opportunity employer and is seeking qualified black and other minority applicants, as well as white candidates, for employment without regard for race, color or ethnic origin, M/F.

Systems Engineer. Milwaukee, WI computer consulting firm seeks individual to perform variety of financial application analysis, design and programming activities using IDMS/ADSO; analyze and design complex financial applications using structured system development life cycle methodology; work independently on programming projects; translate system requirements into program specifications; participate in setting project goals, developing schedules and reporting on projects to management. Requires: BS in Computer Science including 10 business courses in the areas of finance, sales & marketing and production plus 1 year work experience as Systems Programmer/Analyst or Systems Consultant (may be concurrent with special requirements which follow); OR MBA including 6 graduate-level courses in computer systems/programming. Special requirements include (may be pre-graduation): 1 year of coursework or research or 6 months' work experience using the following: Cullinet Corporation's Relational Database software, IDMS/R and ADS/O on-line tools, and other on-line tools including OLM, OLQ, IDD, IDDL, ADS/G and ADS/A; completion of Consulting Training Courses or equivalent coursework in the areas of: Computers in Business, Business Practices, Systems Installations and Systems Design. Salary: $34,320/year; 40 hour work week, M-F. Contact Milwaukee Job Service, Attn.: Ms. Jenn Irven, 819 N. 6th St., Milwaukee, WI 53203. Job Order No. 0380976. Employer Paid Ad.

DATA PROCESSING

AS 400 PROGRAMMER/ANALYSTS

WE'VE GONE INTERNATIONAL

As a result of the extremely favorable response to our products, we seek experienced programmers wishing to be technically challenged while developing new software in a state-of-the-art environment. We are a leading software development company supporting the publishing industry.

Excellent compensation including fully paid benefits. Paid relocation. Suburban Kansas City location, filled with excellent recreational, educational & cultural activities. If you are ready to ADVANCE YOUR CAREER, call Personnel, or send your resume in confidence to:

(913) 451-4618
Attn: Personnel Director
Integrated Newspaper Systems International
10975 Benson Drive
Overland Park, KS 66210
Equal oppty employer M/F/V/H

SYSTEMS ANALYST wanted. Duties: Study the existing manufacturing system. Talk to users about the enhancements to the system. Analyze, design, develop & implement manufacturing software to meet the users requirements using CICS software & COBOL computer language. Giving weekly presentations of enhancements made to clients management and users. Need Bachelor's in Computer Science and 18 months exp in the job offered or 18 months exp as Programmer Analyst, Systems Analyst and/or Computer Consultant, Programmer. Related Experience must involve designing and developing applications software using CICS software and COBOL computer language. Pay is $30,000 per year. 40 hr/wk. Resumes to 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Ref #25389. Employer Paid Ad.

SYSTEMS ENGINEER/ANALYST wanted. Duties: Generally analyzing clients' data processing requirements and computer hardware then designing, developing and implementing a computer system which will process the client's data in the most timely and inexpensive manner on that hardware. Specific duties include designing, developing and implementing manufacturing applications software on an IBM mainframe computer using COBOL language and each of the following utilities: TSO, CLIST, JCL, IMS DB/DC, MFS, BTS. Need Bachelor's in Computer Science or Engineering and two years exp in the job offered or two years exp as Systems Analyst, Programmer Analyst, Systems Engineer, Programmer. One year of the related experience must involve designing and developing manufacturing applications software on an IBM mainframe computer using COBOL language. Six months of the related experience must involve using each of the following utilities: TSO, CLIST, JCL, IMS DB/DC, MFS, BTS. Pay is $30,000/year. 40 hr/wk. Resumes to 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Ref.#67389. Employer Paid Ad.

Let us introduce you to the IDG Communications Computer Careers Network. It's the new advertising service that lets you run the most targeted and cost-efficient recruitment program possible.

Its many options help you recruit qualified computer and communications professionals - regionally or nationally - with combination buys of up to five leading newspapers. And all together, the Computer Careers Network delivers your message to an audience of well over 1 million qualified computer professionals.

Look at what the Computer Careers Network lets you do:

Customize your recruitment program. The Network's five newspapers - *Computerworld, InfoWorld, Network World, Digital News, and Federal Computer Week,* - let you tailor your recruitment program to your specific needs. You can buy as many as five newspapers with add-on options. That way you can recruit from the combination of computer and communications professionals that's best for you.

Target your ad placement. You can place your advertising exactly where you want. If you wish to recruit within a specific area, you can advertise in the regional editions of the newspapers you choose - East, West, or Midwest. Or you can extend your reach by running in two regions - or even nationally. Plus - you can still take advantage of stand-alone national rates for individual newspapers.

Reach qualified professionals cost efficiently. Gone are the days when you have to worry about paying for waste circulation. The Computer Careers Network lets you buy the combination of newspapers that will deliver your recruitment message to qualified computer and communications professionals - and only those qualified professionals you need to reach.

To put the new Computer Careers Network to work for you - regionally or nationally - call the sales office nearest you, or contact **John Corrigan,** Classified Advertising Director, at 508-879-0700 ext 676.

One quick phone call can give you all the information you need on running your recruitment advertising in up to five leading industry newspapers.

Computer Careers Network

Put it to work for you!
Call For more Information
800-343-6474

It's the efficient way to recruit qualified computer professionals.

Now you can target your recruitment advertising to the qualified computer professionals you want to reach - where you want to reach them. All you need is the new IDG Communications Computer Careers Network. Here's how it can work for you:

You choose the newspapers. Depending on who you're looking for, you can select the combination of five newspapers that best suits your needs - **Computerworld, InfoWorld, Network World, Digital News, and Federal Computer Week** Editions.

You choose the region. If you wish to recruit within a specific area, you can advertise in the regional editions of the newspapers you choose - East, West, or Midwest. Of course, national buys of individual newspapers or various combinations are also available when you need to extend your reach.

You don't pay for readers you don't want. Gone are the days when you have to worry about paying for waste circulation. The Computer Careers Network puts you in touch with qualified computer professionals - and only those qualified computer professionals you need to reach.

To put the new Computer Careers Network to work for you - regionally or nationally - call the sales office nearest you. Or contact John Corrigan, Classified Advertising Director, at (508) 879-0700.

Sales Offices:

BOSTON: 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171, (508) 879-0700;

NEW YORK: Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652, (201) 967-1350;

WASHINGTON: 8304 Professional Hill Drive, Fairfax, VA 22031, (703) 573-4115

CHICAGO: 10400 West Higgins Road, Suite 300, Rosemont, IL 60018, (312) 827-4433;

LOS ANGELES: 18004 Sky Park Circle, Suite 100, Irvine, CA 92714, (714) 250-0164;

SAN FRANCISCO: 18008 Sky Park Circle, Suite 145, Irvine, CA 92714, (714) 250-0164;

Join the team that has a vision for itself *and* for you.

Charter Medical Corporation is the nation's largest and fastest growing psychiatric/acute care provider, with more than $1.5 billion in revenues and over 100 hospitals nationwide and more under development. This kind of expansion can only happen when a company has a clear vision of the future. Data processing professionals, using state-of-the-art computers, play a key role at the Charter Medical Corporation of today and tomorrow.

Data Base Administrator

Selected candidate will have the opportunity to play a key role in the initial stages of a multi-year project to implement IBM's DB2 database. Should possess extensive experience in the design, development and implementation of DB2.

Senior Systems Analysts, Systems Analysts

Analysts will join an experienced team that is in the design phase of a crucial strategic applications project that will further ensure market leadership into the next century. Must possess extensive design and development experience in both mainframe and mini-computer environments.

Lead Programmers, Senior Programmers

Charter's rapid growth has created exceptional opportunities in the field of developmental activities. Should possess extensive COBOL/4GL and relational database experience in the IBM mainframe, Wang mini-computer and personal computer environments.

Charter Medical Corporation offers an excellent benefits package, exceptional visibility and the chance for rapid promotion within the organization. Please send your resume along with salary history to:

Charter Medical Corporation
Attn: Laura Pugh
Manager, Administrative Recruitment
577 Mulberry Street
Dept. CW-11/20
P.O. Box 209
Macon, GA 31298

CHARTER MEDICAL CORPORATION

An Equal Opportunity Employer.

California State Polytechnic University, Pomona
College of Business Administration

COMPUTER INFORMATION SYSTEMS DEPARTMENT
FACULTY POSITIONS 1990-91

One or more positions in Computer Information Systems Department, College of Business Administration, California State Polytechnic University, Pomona.

Areas in DPMA-CIS curriculum with an associated EDP Auditing program (M.S.)

Master's degree required; Ph.D. in computer-related discipline preferred. Teach/business experience required.

Interested persons must submit an application form, curriculum vitae and names of three references postmarked no later than December 4, 1989.

To apply: Dr. Carl Clavadetscher, Chair, Computer Information Systems Department, California State Polytechnic University, 3801 W. Temple Ave., Pomona, CA 91768.

AA/EEO/Employer

Sunbelt Opportunities

DICS Prog/Anal's (MVS or DOS)	30-35K
S/38 AS/400 Prog/Anal's (RPG III)	29-36K
TANDEM Prog/Anal's	30-38K
HP 3000 Prog/Anal's (COBOL)	30-35K
DB2 SQL Prog/Anal's	30-40K
MSA or M&D Sys Anal's	35-45K
Bank Prog/Anal's or Sys Anal's	30-45K
Mfg Sys Anal's	35-43K
Retail Prog/Anal's	30-35K
Insurance Prog/Anal's	30-35K
ASSEMBLER Programmers (IBM)	29-34K
ADABAS/NATURAL Prog/Anal's	30-36K
ORACLE SQL Prog/Anal's	29-39K
VAX Prog/Anal's, Soft Eng'rs	32-40K
FOCUS Prog/Anal's	29-35K
IDMS, ADSO Prog/Anal's	29-35K
IMS, DB/DC Prog/Anal's	29-36K
PL/1 Prog/Anal's (VM or MVS)	30-36K
Accounting Sys Anal's	35-49K
EDP Auditors	33-43K

Charlotte's largest executive search firm in business since 1975. 300 affiliates. We place candidates in the Southeast and nationwide. Our client companies pay relocation and interviewing expenses, and our fees.

Corporate Personnel Consultants
3705 320 Latrobe Drive, Box 221739
Charlotte, NC 28222 (704) 366-1800
Attn: Rick Young, C.P.C.

World-Class Opportunities in New Jersey and throughout the US

For over 20 years, AGS, a NYNEX Company, has played a major role in designing and building computer systems for renowned companies in computer manufacturing, telecommunications, financial services, consumer products and government.

We currently have opportunities in our 36 branch offices nationwide for Data Processing Professionals who are eager to begin a world-class career by joining a group of AGS' top performers.

Immediate openings exist for Computer Professionals with experience in the following:

- **DB2, TELON, IMS, CICS**

AGS offers outstanding career advancement, competitive salaries and an excellent benefits program including medical and dental coverage, relocation assistance, training, tuition reimbursement, a 401k savings plan and more.

To find out why over 2,000 computer professionals consider AGS a 'world-class' employer, call or send your resume to:

Loree Tisdale, National Recruiter
AGS Information Services, Inc.
1139 Spruce Drive
Mountainside, NJ 07092

1-800-HIRE AGS
Fax: (201) 654-9794

AGS
A NYNEX Company

An Equal Opportunity Employer M/F/H/V

Northern California

EXCLUSIVE POSITIONS

Contract & Permanent

IDMS, CICS, IMS
VAX-RDB

- Sr. Prog. Analyst
- Sr. Bus. Analyst
- Project Managers
- Systems Programmers
- Data Base Analysts
- Technical Editors

Chuck Klein & Assoc.
3840 Thorson Dr.
Placerville, CA 95667
(916) 644-6396

SYSTEMS ANALYST (Database): Design, program, & test database software applications & prepare documentation. Implement data processing assignments. Develop & implement relational database product DB4 for integration into financial applications products. Develop, maintain & provide advice on DB4 & DB4 Screens & tech. specs of UNISYS OS1100. Analyze & evaluate application requirements & provide solutions; Write functional specs. Prepare work plans & tech documentation & provide assistance with documentation; Analyze, evaluate, solve problems & monitor system performance; Install & maintain new releases of systems software, with minimal impact on existing machine utilization & availability; Respond to system performance problems; Conduct research & provide solutions to tech. questions & problems; Provide customer support & database design & DB4 education. Use Assembly & skill in UNISYS OS1100 with knowledge of its internal components. $54,500/yr, 40 hrs/wk. Requires BS in Comp. Sci. or any Science discipline using computers & math. 2 yrs. in job offered or 2 yrs. as Systems Analyst or Consultant including 2 yrs. in developing relational databases & systems internals. Skill in DB4, UNISYS OS1100, internal EXEC components & ASSEMBLY. Resume to: Job Service, 1234 South Main St., Salt Lake City, UT 84147. JO #3942213.

New Challenges New Opportunities

Immediate need for per diem consultants and permanent employees to work on state-of-the-art developments for Fortune 500 clients in Washington DC, North Carolina, New York, New Jersey, Texas and Georgia.

DB2
ADABAS/NATURAL
UNIX

Other positions also available. Excellent daily rates or salaries plus benefits. No Entry Level.

Call/Write/Fax: Recruiters

Structured Logic Systems, Inc.
Two Penn Plaza, Suite 1540, New York, NY 10121
Phone: 212-947-7510; 1-800-537-1132
Fax: 212-947-9338

MAINE - NH

We have specialized in data processing professional placement in Maine & NH for a quarter of a century. If you qualify for positions in the $25,000-$50,000 range, please contact us in total confidence. Our clients pay our fees and provide relocation assistance.

ROMAC.
Att: Dept. 2
P.O. Box 7040DTS
Portland, ME 04112
(207)773-4749

Software Engineers

NCR

Develop your career as you develop technology.

E&M Clemson, NCR's Workstation Products Division plant has immediate openings for innovative, highly motivated software developers at our facilities in Liberty, SC.

Working on our high performance Intel processor-based workstations, you will contribute to the delivery of Microsoft's MS-OS/2. In addition, you will use your expertise to develop and maintain PC firmware.

BSEE or BSCS with 286/386 Assembly language is essential, along with a minimum of 3+ years' experience with PC BIOS code or other PC hardware driver software. Preference will be afforded to those having OS/2 development experience in "C." However, individuals with demonstrated ability in the DOS, Windows or Xenix/UNIX* environments of PC compatible hardware are welcomed.

We offer a generous salary and benefits package plus many recreational and cultural opportunities at our location in the dramatic foothills of the Blue Ridge Mountains. For immediate consideration, send your resume with salary history to:

Manager, Personnel Resources
Dept. 56K
NCR Corporation
Workstation Products Division
1150 Anderson Drive, PCD Clemson
Liberty, SC 29657

NCR...people working together to create value.

An equal opportunity employer.

*Registered trademark of AT&T.

PROGRAMMER ANALYST - Partake in design & development of software in ADABAS NATURAL environment. Require Bachelor of Science or equivalent in Quantitative Discipline and 4 years experience including ADABAS/NATURAL, ADAPREP, Data Base Administration, DBase III, III+ and New Systems Development. Salary: $38,000 per annum. Job Location and interview: Dover, DE. Resume to: Michael Stanley, 710 North King St., Ste. 301, Wilmington, DE 19801

PROGRAMMERS & DBA'S
ADABAS/ NATURAL/PREDICT

Join the best ADABAS/NATURAL team. Assignments range from programming to performance and tuning. Opportunity for technical Instructor training. Minimum 3 years exper with ADABAS & NATURAL. Effective oral and written communication skills and out-going personality required. Send resume to:

LOGIC UNLIMITED, INC.
1420 Springhill Road,
Suite 150
McLean, VA 22102
Attn: Pat White
(703) 827-5740

VM SYSTEMS PROGRAMMER

University of Notre Dame seeks qualified individual to support VM/CMS on IBM system for academic applications. Bachelor's degree/equivalent experience with academic VM environment required. Ability to support services such as system utilities, mail, communications with MVS/TSO system, Bitnet and TCP/IP campus network essential. Send letter, resume, salary expectations and names of three references to: Department of Human Resources, University of Notre Dame, Notre Dame, IN 46566. EOE/AA

Database Software Engineer
Design and development of relational database systems software on parallel processor systems, incl. performance analysis, implementation, etc. Integrate existing parallel tools with database software. B.S. Computer Science. 3+ yrs. exp. in database software engineering or related occupation. Req. exp. in design and development of database management systems software for multiusers, inc. exp. with porting "C", SQL, fourth generation application tools, and in developing, high performance UNIX SORT. Also exp. with 4.2 BSD, DYNIX, O/S dev. tools and query languages. $3,000/mo.; 40 hrs./wk. Place of employment and interview: Beaverton, OR. Must have legal right to work. Clip ad and send with resume to: Job Order 2418648, 875 Union Street, N.E., Salem, OR 97311 not later than Dec. 27, 1989. EOE.

MARKETPLACE

Schmoozing with the dealers

Talk to used equipment vendors to stay on top of the competitive market

BY MICHAEL ERBSCHLOE
SPECIAL TO CW

Used computer equipment can be instrumental in building and maintaining less costly information systems at companies, both large and small ones alike. To do so, however, you must build solid relationships with dealers.

Used equipment can meet short-term needs, allowing major purchases to be postponed until new technology with better price/performance is available. It is not uncommon for small companies that can meet capacity requirements on small and relatively inexpensive machines to keep their systems alive with used equipment that is no longer manufactured.

The keys to buying used equipment are keeping abreast of the market and maintaining contacts with dealers. Doing so has enabled many IS managers to stay within their budgets while delivering vital services.

The market for used equipment differs from that for new equipment in that it generates considerably more competition among dealers. This situation creates greater opportunity for you to shop for the best price, and maintaining good business relationships can help you get the best price that is available when you need equipment on short notice.

When assessing the used computer equipment market, you should pursue two directions simultaneously: Relationships with both local and national dealers can provide ready means of obtaining equipment.

You should become familiar with a few national dealers. Dealers with a lot of equipment that has been leased often have very good offerings. You will find that some of these dealers offer equipment that has just come off lease and is nearly new. Some large dealers print catalogs, and others send out monthly bulletins stating what they have available. You should arrange to be on their mailing lists.

You should also become familiar with a few local or regional dealers and maintain contact with them. Many of the local dealers do not provide printed information, but occasional conversations can keep you updated on the equipment they have available or may soon receive.

You probably have a long list of items you need for your data centers or end-user departments. Select items on the list for which used equipment could be appropriate — for example, terminals and modems for your company's warehouse or motor pool, a personal computer for a parts room or terminals for occasional backup use in end-user departments.

> ANOTHER way to cut the price of equipment from a local dealer is to buy it as soon as the dealer takes possession of it.

Once your list is compiled, call in a local dealer. Discuss your needs and give the dealer an opportunity to bid on the equipment or provide a locating service. Unless you have an urgent need for the hardware, you should give the dealer a few days to work up a bid for equipment in stock and a few weeks to gather information on equipment that can be obtained elsewhere.

Meanwhile, compare your needs with the price lists and catalogs from the national dealers. If there is something you need that you do not see there, you may call and inquire about its availability.

National dealers will often offer discounts on the basis of volume purchases, so it may be advisable to make as large a purchase as is reasonable from one of them. Local dealers may provide discounts or attempt to meet or beat the national dealers' prices, depending on how much business you have done with them. The local dealers may also offer better prices if they feel that you will make additional purchases from them in the future.

Another way to cut the price of equipment from a local dealer is to buy it as soon as the dealer takes possession of it. This tactic is one reason why ongoing communication with local dealers is helpful. If you have a list of equipment you would like to buy, inform your local dealer — he may get it soon or encounter an offer for it.

A dealer that delivers

Moreover, the local dealer can pick up equipment in the morning and deliver it to you in the afternoon. Doing business this way lets the dealer cut storage and insurance costs; ultimately, you are the one who saves money. Of course, you must test the equipment and accept it or reject it quickly.

The same approach can be used with a national dealer if you have established a good relationship with one or have a history of purchases from the company — although volume may be the key in this situation. If the national dealer knows what you are looking for, it may be able to arrange for delivery directly to you.

This situation is especially likely in the case of terminals or storage devices. For example, if a dealer knows it will get 100 terminals and you need all of them, you can arrange to have the terminals shipped to you the same day the former user surrenders possession. The discounts you can realize in such circumstances can be considerable.

To solidify a relationship with a dealer whom you feel may be able to meet your needs, you may want to buy something from him. Doing so will convince him you are serious about establishing a business relationship.

Erbschloe is executive editor at Computer Economics, Inc. in Carlsbad, Calif.

Index

Marketplace 126
Buy/Sell/Lease 126
Software 130
Bids Proposals/Real Estate 130
Graphics/Desktop Pub 130
Perpherals/Supplies 130
Business Opportunites 130
Time/Services 130
Training 132

Buy/Sell/Lease

IBM SPECIALISTS
SELL • LEASE • BUY
S/34 S/36 S/38 AS/400
3741 3742
• New and Used • IBM Maintenance Guaranteed
• All Peripherals • Immediate Delivery
• Upgrades and Features • Completely Refurbished
800-251-2670
IN TENNESSEE 615/847-4031
CMA COMPUTER MARKETING of America, Inc.
PO BOX 71 • 610 BRYAN STREET • OLD HICKORY, TENNESSEE 37138

Reconditioned
digital™ IBM
Equipment
Whatever your requirements are for Digital Equipment, call CSI first! Buying, selling, trading, leasing, consignments - we do it all!
CSI sells all equipment with a 30 day unconditional guarantee on parts and labor and is eligible for DEC or IBM maintenance.
Offering systems, disk drives, tape drives, printers, terminals, memory, options, boards, upgrades and many more.
CSI Computer Systems, Inc.
75 Toeca Dr. Stoughton, MA 02072
CALL TOLL-FREE 1-800-426-5499
In Mass. (617) 344-9600
FAX (617) 344-4199

BUY • SELL • RENT • LEASE
MEMOREX · TELEX
TERMINALS • PRINTERS
CONTROLLERS
MODELS: 078, 079, 178, 179, 276, 277, 278, 287D2, 387
CALL PETE BOCKTER
LEASING ASSOC. CORP.
ONE CIRCLE WEST
STAMFORD, CT 06902
(203) 978-1400

SUB-LEASE
NAS 8023
Mainframe
3.2 Mips
IBM Compatible
Available Immediately, Call:
800-441-1318, Ext. 2404
In PA 800-441-1317

The BoCoEx index on used computers

Closing prices report for the week ending November 10, 1989

	Closing price	Recent high	Recent low
IBM PC Model 176	$500	$750	$500
XT Model 086	$765	$1,150	$700
XT Model 089	$1,025	$1,400	$950
AT Model 099	$1,600	$1,775	$1,500
AT Model 239	$1,725	$2,100	$1,700
AT Model 339	$1,825	$2,000	$1,700
PS/2 Model 50	$1,525	$1,900	$1,500
PS/2 Model 60	$2,700	$3,100	$2,500
Compaq Portable I	$650	$750	$325
Portable II	$1,625	$1,725	$1,550
Portable III	$2,550	$2,975	$2,500
Portable 286	$1,600	$2,000	$1,600
Plus	$750	$950	$675
Deskpro 286	$1,775	$2,350	$1,700
Deskpro 386	$2,800	$2,900	$2,500
Apple Macintosh 512	$675	$900	$550
512E	$750	$925	$550
Plus	$925	$1,050	$900
II	$3,500	$4,000	$3,300
Zenith 181	$1,000	$1,000	$900
Apple IIGS dual floppy	$1,360	$1,475	$1,100

INFORMATION PROVIDED BY THE BOSTON COMPUTER EXCHANGE CORP.

Buy/Sell/Lease

WANG

SAVE 50% or more

on WANG remanufactured

CPU's • OIS • PC • VS • PERIPHERALS

- Free Installation by your Wang technician
- Unconditionally guaranteed to the Wang Service Contract

wpb WORD PROCESSING BROKERAGE CORPORATION

Authorized WANG Remanufactured Dealer

1-800-223-9264

IBM

BUY · SELL · LEASE

Member Computer Dealers & Lessors Association

CDLA

SYSTEM 36/38

AS/400

43XX 30XX

AT&T VOICE SYSTEMS

SERIES 1

- Processors
- Peripherals
- Upgrades

DEMPSEY & ASSOCIATES Inc.

18377 Beach Blvd., Suite 323
Huntington Beach, CA 92648 (714) 847-8486

(800) 888-2000

PRIME

EXPERIENCED SYSTEMS AND PERIPHERALS

BUY-SELL-LEASE-BROKERAGE

NEW PLUG-COMPATIBLE DISK, TAPE, MEMORY

PLUS
THE FASTEST I/O AVAILABLE ANYWHERE

1ST SOLUTIONS, INC.
11460 N CAVE CREEK ROAD
PHOENIX, AZ 85020
ASK FOR DON SHIFRIS

CDLA Member Computer Dealers & Lessors Association 602-997-0997

NORTHEAST MINICOMPUTER, INC.
55 High Street, Unit 6
Billerica, MA 01862

Wants to Buy Your Surplus DEC Computer Equipment

We Pay Cash for Your Unwanted Computer, Peripherals, Options, Memory, and Terminals.

Call 1-800-343-8302
or in Mass.
1-508-663-2550.
Or Fax Your List
1-508-667-0718

Turn Your excess inventory into Cash $$$$

dda NMI

HONEYWELL

LEVEL 6 DPS 6 SERIES 16

- Complete Minicomputer Line New & Used
- All Peripherals and Terminals
- Upgrades and Features
- Depot Repair Capability
- Honeywell Maintenance Guaranteed
- Immediate Delivery Low Prices
- HDS 5 and HDS 7 Compatible Terminals

The Recognized Leader in Honeywell Minicomputer Sales and Support

BCS

BOUDREAU COMPUTER SERVICES
100 Bearfoot Road
Northboro, MA 01532
(508) 393-5839
FAX 508-393-3781

We buy, sell, lease & rent quality new and used equipment. And we stand behind it for a year.

VAX 11/785 XAAE Loaded, V.M.S. $10,995.	Limited Supply RA82-AA $9,995. Or Make Offer Call Now	TA81-AA ..... $10,995.
VAX 11/780 XAAE Complete System V.M.S. $1,795.		TU77-FB ..... $995.
VAX 11/750 XAAE Complete System V.M.S. $1,495.		Kennedy 9000 ..... $495.
		HSC5X-BA/CA ..... $8,495.
		DW780-AA ..... $495.
		MS780-FD ..... $89.
		MS750-CA ..... $99.
		FP780-AA ..... $495.

RA81-AA ..... $2,495.	LA100-ZA ..... $395.	VT 100-AA ..... $89.
RP06-AA ..... $495.	LA120RA/BA/AA $425.	VT 101-AA ..... $99.
RL02-AA ..... $149.	LP25-DA ..... $895.	VT 102-AA ..... $139.
RX50-AA ..... $129.	Printronix P300 $1,495.	VT 52-AA ..... $89.
RK07-AA ..... $149.	LQP02-AA ..... $249.	VT 131-AA ..... $199.
RM05-AA ..... $895.	Data Products B300 ..... $995.	VT 125-AA ..... $199.
RM03-AA ..... $395.	Fuji SP830 ..... $199.	VT 220-A/B/C ..... $285.
RX02-BA ..... $299.	LQP03 w/sheet feeder .. $295.	VT 320-CA ..... $449.
	Data Products 2470 ..... $495.	

Corporate Headquarters
US + CANADA
CALL 800-667-3636
375A West Hollis St
Nashua, NH 03061
FAX: 603-886-0914

TRIDEX CORPORATION

For your convenience from: IL, IN, WI, MO, & KY
CALL 800-667-9696
2091 Creekside Dr.
Wheaton, IL 60187
FAX: 312-690-3160

sun microsystems IBM digital

PRINTERS

IBM 3262 - 003
IBM 3268 - 002
IBM 3287 - 002; CO2

SALE OR LEASE

Bluebonnet Computer Co.
Austin, TX

(512) 926-3900

Member CDLA

BUY & SELL DATA GENERAL

Desktop to MV's
Systems - Upgrades
Options

AMES SCIENCES, INC.
(301) 476-3200
FAX: (301) 476-3396

GTEX FINANCIAL GROUP, Inc. EQUIPMENT LESSOR AND DEALER

IBM

BUY SELL LEASE

PS/2 OPERATING LEASES

3084 3090 PERIPHERALS

OEM/PCM LEASES

800-888-7568

FAX 214/783-1379

Member CDLA EST. 1978

Buy • Sell • Lease • Repair • New • Used

DEC

Peripherals Systems Upgrades

14 YRS EXP

DG • APOLLO • SUN

International Computer Exchange, Ltd.

1-800-ICE-BUYS

163 Main Street
Kingston, MA 02364

George H. Trawinski
617-585-6686
FAX: 617-585-9177

Computerworld's

Classified Marketplace

gives you buyers with extensive purchase influence.

That's because Computerworld's Classified Marketplace reaches MIS/DP professionals who have extensive involvement in volume purchasing. In fact, a full 95% are involved in purchase decision making for their organizations. They determine needs, evaluate technologies, identify solutions, and select products and vendors for the entire range of information systems, as well as related products and services.

So if you're selling computer products and services, advertise in the newspaper that delivers buyers with volume purchasing influence. Advertise in Computerworld's Classified Markeplace!

For more information, call

800/343-6474
(in MA, 508/879-0700).

CLASSIFIED MARKETPLACE

Where all computer buyers and sellers can go to market.

DEC VAX & AT&T

BUY-SELL-NEW-USED

Systems, Peripherals, Options available for sale

Looking to purchase VAX and AT&T Systems, Hardware

LAKEWOOD COMPUTER CORP.

436 Link Lane
Ft. Collins, CO 80524

(303) 493-8406 FAX:(303) 493-8409

dda

We Buy & Sell

DEC

Systems
Components

Digital Computer Resale

call:713 445-0082

600 Kennck Ste C22
Houston, Tx 77060

WE WILL BUY

IBM SYSTEM
★ PERIPHERALS ★

2914, 3081, 3082, 3203, 3272, 3274, 3276, 3277, 3278, 3287, 3410, 3411, 3420, 3683, 3684, 3705, 3725, 3726, 3800, 3803
& most Personal Computer Systems

IN WHOLE OR PARTS.

Please Call Purchasing
Computer Service Supply Corp.
1-800-255-7815
In N.H. (603)437-0634

CSS

The Computer Parts Vaults

Buy/Sell/Lease

IBM 3X and AS/400 equipment at IPL prices

Most people know IPL Systems as a provider of cost effective alternatives to IBM in storage products. What they may not know is that **IPL Systems offers IBM products** at the best prices in the industry.

In fact, if you send IPL a written quote on any IBM product in stock, IPL will beat the quote as well as ship within 24 hours under Net terms. All IBM products sold are guaranteed to be covered under your IBM or third party service agreement.

We even welcome you to try any product for up to 7 business days with no obligation to purchase. Don't pay more than you have to!

IBM ■ Memory (3X, AS/400) ■ Tape (3X, AS/400) ■ DASD (3X, AS/400)

Call 1-800-338-8ipl (In MA, 617-890-6620)

ipl systems, inc.

LEAS PAK International® 1-800-532-7725

2120 LeasPak Parkway • Bedford, TX 76021 • D/FW Metro 817-267-2841 • 1-800-532-7725
8283 N. Hayden Rd., Ste. 278 • Scottsdale, AZ 85258 • 602-951-4511 • 1-800-678-4409
5809 Reeds Rd., Ste. 280 • Shawnee Mission, KS 66202 • 913-432-1541

SYSTEM/36	AS/400™ All Models!	SYSTEM/38
• B to D Upgrades	Call for Quote	• Model Upgrades
• 1 mb/2 mb Memory	5363 • AS/ENTRY All Models/Features	• Communications
• 358 mb DASD	PRINTERS: 4224 5224	DISPLAYS: 3476 3196 3180
• 200 mb DASD	4234 5225	3477 3197 5291
• Communications	6262	5251
• All Models/ Features	DASD: 9332 9335	CONTROLLERS: 5394 5294

• DASD • All Features

BEST AUTHORIZED DISTRIBUTOR U.P.S. for S/36 • S/38 • AS400 350 VA to 15 KVA Call for Info

NOW BUYING AS/400's • S/36's • S/38's • PERIPHERALS
$$$ WE PAY CASH $$$
(All equipment subject to prior sale or lease.)

MEMBER ASCD AMERICAN SOCIETY OF COMPUTER DEALERS

IBM SYSTEM 36/38 4300 SERIES 1 SYSTEM AS/400

• Lease • Trade

MEMBER OF CDLA

* SPECIAL LEASE RATES ON NEW AS/400's

• Buy • Sell • New • Used

• IBM Warranty/IBM Maintenance Guaranteed • Disk • Terminals

• Flexible Lease Options Tailored to Your Needs • Printers • Tape

• Equipment Configured To Your Requirements • All CPU Upgrades

MEMBER OF WAEL

NEWPORT LEASING, INC.
(800) 6789-IBM®
2 Faraday, Irvine, CA 92718
714/770-2122 / FAX: 714/770-5441

IBM IS A REGISTERED TRADEMARK OF INTERNATIONAL BUSINESS MACHINES INC.

VAX RENTALS

MV 3600
MV 3800/3900
VAX 6000 SERIES
VAX 8000 SERIES
Systems & Peripherals

• Fast Turnaround
• Dependable Products
• Upgrade/Add-On Flexibility

• 6 Months • 12 Months • 24 Months

BROOKVALE ASSOCIATES

EAST COAST (516) 273-7777 WEST COAST (206) 392-9878

WANG

Buy-Sell or Trade
VS PC MVP OIS

Systems in Inventory
VS 7150 / 100 / 85 / 65 / 6 / 5

And Peripherals
4230A • 4230 • LPS-8 • 2256C
PC/AT *WORKSTATIONS

Genesis Equipment Marketing
Phone (602) 948-2720
Fax (602) 948-0615

* AT is a registered trademark of I.B.M.

CALL US LAST

GET YOUR BEST PRICE
Then Call
COMPUTER BROKERS, INC.
For The Best Deal
WE
Buy - Sell - Lease - Rent
New and Used IBM Equipment
AS400 - System 36, 38, 43XX

Call 800-238-6405
IN TN 901-372-2622

COMPUTER BROKERS, INC.
2975 Shelby St., Memphis, TN 38134
"Since 1974"

HP 3000

ATP's • S/70
7937H • 7933H

Available in Quantity

Processors • Peripherals Systems

All In Stock - Immediate Delivery

All warranted to qualify for manufacturer's maintenance

BUY • SELL • TRADE
RENT • LEASE

ConAm Corporation
It's Performance That Counts!
800/643-4954 213/829-2277

Advertise Your Products In The

CLASSIFIED MARKETPLACE

Featuring:

- ☐ Buy/Sell/Lease
- ☐ Software
- ☐ Communications
- ☐ Time/Services
- ☐ Business Opportunities
- ☐ Hardware
- ☐ Peripherals/Supplies
- ☐ Graphics/Desktop Publishing
- ☐ Bids/Proposals/Real Estate

Reach over 612,000 information systems professional by placing your company's message in CLASSIFIED MARKETPLACE.

Name: _____
Title: _____
Company: _____
Address: _____
City: _____
State: _____ Zip: _____
Telephone: _____
Ad Size:
_____ columns wide x _____ inches deep.
☐ I am enclosing ad material with this form.

Return this form and advertising material to:

Computerworld
Classified Marketplace
375 Cochituate Road, Box 9171
Framingham, MA 01701-9171

(800) 343-6474
(In MA., (508) 879-0700)

WANTED

OBSOLETE AND EXCESS COMPUTER EQUIPMENT

Top Cash Paid

We purchase all types of obsolete or excess computer equipment and peripherals. We pay costs for all shipments as well as top prices.

Call today for a quote on your system

COMPU-SCRAP, Inc.
Randolph, MA 02368
(617) 341-2695
Call Collect!

IBM Unit Record Equipment

Data Modules/Disk Packs
Magnetic Tape/Diskettes

029-082-083-084-085-088
129-514-519-548-557-188

2316-3336(1)&(11)-3348(70)
80-200-300 MB
Disk Packs

Thomas Computer Corp.
5638 W. Howard Chicago IL 60648
800-621-3908 312-647-0880

Associates inc.

• Data General • Fujitsu
• Data Products • CDC
• Printronix • Zetaco

BUY SELL TRADE

(617) 982-9664
FAX: (617) 871-4456

Buy IBM Sell
36 38 4300
DISPLAYWRITERS
DEC
WANG
XEROX
Printers • Terminals • Disk's
LRK RESOURCES UNLTD INC.
713-437-7379
FAX 713 437-4945 800-523-8903

Go Shopping in... Computerworld's
CLASSIFIED MARKETPLACE
Call for all the details
(800) 343-6474
(In MA., (508) 879-0700)

Buy/Sell/Lease

IBM 3380 MODEL AK4 - BK4'S

SALE OR LEASE

ENTREPO FINANCIAL RESOURCES, INC.

215-886-2300

CDLA MEMBER COMPUTER DEALERS LESSORS ASSOCIATION

Win with Ceres...

AS/400™ MODEL 45
16 MB PROCESSOR AND 3.2 GB of DASD!
Current long-term lease price,
JUST $2,899 per mo.
CALL FOR PURCHASE QUOTE

Configurations available to meet your specific requirements.
Conversions and education assistance also available.
CONTACT PAUL HAIRE **1-800-532-0692**
In New York **(212) 279-4467**

The Source for the System.

CERES CAPITAL Corporation

A Division of PacifiCorp Capital Corporation

AS/400 is a registered trademark of IBM

350 Fifth Avenue, New York, New York 10118

Computerworld's

Classified Marketplace

delivers your message in companies that plan to buy your product or service.

From PCs to minis, mainframes to supercomputers, Computerworld's readers buy products across all ranges of today's computers. So if you're selling, advertise in the newspaper that delivers readers that plan to buy YOUR product or service. Advertise in Computerworld's Classified Marketplace!

For more information, call:

800/343-6474
(in MA, 508/879-0700).

BUY • SELL • LEASE
AS/400 S/38, 36, 34 SERIES 1

- SYSTEMS
- PERIPHERALS
- UPGRADES

SOURCE DATA PRODUCTS
19762 MacArthur Blvd. #120
Irvine, CA 92715
(714) 851-1970
(800) 333-2669

Buy **RT AS/400 SERIES/1 S/36,38 937X 4300** Sell
Lease Rent

All IBM Machines and Parts

612-942-9830

DATATREND Inc.
10250 Valley View Road, Suite 149
Eden Prairie, Minnesota 55344

EXSEL INC.
DIRECT
EXCLUSIVE... GENUINE IBM Personal System/2 Model 50 Computers

INCLUDES NEW 14" AMDEK VGA MONOCHROME MONITOR FREE!

50% SAVINGS!

At the "Right" Price Point!

THE EXSEL OPPORTUNITY

Exsel Inc. is offering the popular IBM PS/2 Model 50 fully remanufactured at a fraction of its original price! All systems are factory tested and repackaged to a LIKE NEW condition and include a 90 day warranty. It's the genuine IBM PS/2 product that you have seen advertised on television, the radio, newspapers and referred to as "The next generation in personal computing."

THE PS/2 MODEL 50 FEATURES INCLUDE:
- 1MB Random-access Memory on the System Board with add-on card capability of 7MB.
- 101 Key Enhanced IBM Keyboard
- 1 full size expansion slots; 1 math coprocessor socket
- One 3.5" 1.44MB Half Height floppy
- One 20MB, 80MS fixed disk drive
- Serial, Parallel, Point Device Port and VGA card—standard.
- Microprocessor—Intel 80286 (10.0 MHz) Microchannel
- 16 Bit Bus architecture
- Runs most popular Personal, Educational, Business Software
- Comes with Personal System 2 Quick Reference Guide
- 5.5"H x 14.00"W x 16.00"D; 21 lbs. U.L. Listed, CSA approved

BRAND NEW AMDEK MODEL 632 VGA MONOCHROME MONITOR

Designed to work in harmony with the PS/2 Family, high quality 14" etched glass screen eliminates glare and minimizes eye strain. This monitor offers 4 resolution modes for compatibility w/IBM-developed graphics standards.
- 640 x 480 PS/2 VGA Standard
- 640 x 400 (CGA)
- 640 x 350 (EGA)
- 720 x 400 (text mode)

A built-in tilt and swivel stand and brightness/contrast controls all for reduced eye strain. U.L. listed; FCC Class B and CSA approved. 8283 Value included— FREE! Standard Exsel 90 day Back to Depot warranty, includes all parts & labor.

PS/2 SYSTEM AND MONITOR. ORIGINALLY MADE TO SELL FOR $3840.00
EXSEL LOW PRICE: **$1888.00**
SHIPPING & HANDLING $49.00 ea.

FAX YOUR ORDERS 24-HOURS A DAY: (716) 272-0624

EXSEL INC. THE ALTERNATIVE SOURCE FOR THE FUTURE

(716) 272-0770 • (800) 634-3931 • FAX (716) 272-0254

TO ORDER BY CREDIT CARD, CALL MONDAY THROUGH FRIDAY 8:30 AM - 6 PM EST. TOLL FREE:
1-(800)-624-2001
IN NY: 716-272-0770

We buy NEW-USED-AS-IS computers and peripherals
Industrial Electrosurplus
Tel. (508) 768-3480
FAX (508) 768-3479

BUY SELL LEASE
XYONIX INC., one of the largest distributors of new, used, and refurbished DEC, IBM, SUN, & AT&T computer equipment, stresses:
- *Customer satisfaction*
- *Service with a personal touch*
- *Honesty i.e; We stand behind our products*
- *Prompt delivery*
- *Competitive pricing*
- *Extensive inventory*

CALL TODAY!!!
XYONIX INC.
(603) 893-4200
OR FAX TO:
(603) 893-4859

Computerworld's

Classified Marketplace

needs only 6 days notice to run your ad!

When you're selling, you want your advertising to hit the market quickly and frequently. You can't afford to wait for an issue that's coming out several weeks -- or -- months -- into the future. With Computerworld, there's no waiting for the next available issue because we've got one waiting for you every week. What's more, your ad can appear in the Monday issue of Computerworld if you order it as late as 6 days prior to the issue (Tuesday).

So if you're selling computer products or services, advertise in the newspaper that won't keep you waiting. Advertise in Computerworld's Classified Marketplace!

For more information, call:

800/343-6474
(in MA, 508/879-0700).

CLASSIFIED MARKETPLACE
Where all computer buyers and sellers can go to market.

IF YOU'RE BUYING, WE'RE SELLING

IF YOU'RE SELLING, WE'RE BUYING
IBM SYSTEMS
Buy • Sell • Lease PERIPHERALS

(800) 331-8283
TOLL FREE

(213) 394-1561
CALIFORNIA

Ocean Computers, Inc.
919 Santa Monica Blvd., Ste. 200
Santa Monica, CA 90401

CDLA

CLASSIFIED MARKETPLACE
Where Computer Professionals Shop
(800) 343-6474
(in MA, 508/879-0700)

BUY OR SELL NEW OR USED

IBM PC * XT * AT * PS/2
COMPAQ * HP * AT&T * WANG
MACINTOSH * APPLE 2

1-800-262-6399

Boston Computer Exchange Corporation
MA 617-542-4414
FAX 617-542-8849

CLASSIFIED

Software

QUATTRO® PRO

Borland International's NEW QUATTRO PRO, with VROOMM™ technology, is setting performance standards for power spreadsheet users. Join the spreadsheet revolution today and order QUATTRO PRO from Programmer's Connection at our special limited time sale price of **$269***, regular price is $329.

To Order Call:
Programmer's Connection

USA 800-336-1166
Canada 800-225-1166
FAX 216-494-5260

Call for your FREE copy of our Buyer's Guide, the *CONNECTION*, with over 1,300 personal computer products.

*Special price expires December 31, 1989. Price includes UPS Ground shipping to the lower 48 states. Express rates are available.

$269

ROOMER2

Create computer room layouts and 3D views with your IBM PC or compatible. New library of computer components makes it quick and easy. From $295. Call for free brochure. Money Back Guarantee

Hulnagel Software • PO Box 747 • Clarion, PA 16214 • (814) 226-5600

Business Opportunities

FOR SALE

Contract Programming Services Firm:

- *$800K sales average, Inc. since 1985*
- *Above average earnings*
- *Two western NY state locations*
- *Extensive "Approved Vendor" status*

Co. seeking merger or acquisition to capitalize on major market opportunities. Write:

CW-16832, Computerworld, Box 9171, Framingham, MA 01701-9171

It's the *Classified Marketplace*

Reach Computer Professional Where They Shop For:

- ☐ Buy/Sell/Lease
- ☐ Hardware
- ☐ Software
- ☐ Peripherals/Supplies
- ☐ Communications
- ☐ Graphics/Desktop Publishing
- ☐ Time/Services
- ☐ Bids/Proposals/Real Estate
- ☐ Business Opportunity

CALL NOW

800-343-6474
(in MA., 508/879-0700)

Graphics/Desktop Publishing

PC SCREEN TO BIG SCREEN

Look to BOXLIGHT for the Largest Selection of LCD Pads

TRUE COLOR SYSTEMS from $4995

MONOCHROME SYSTEMS from $599

Solutions for VGA, EGA, CGA, All Macs, DEC VT 100s, 220s, IBM Terminals and More.

BOXLIGHT™ CORPORATION
206-697-4008

VISA, M/C, AMEX, COD

Computer-Based Presentation Systems Since 1984

Slides Overheads Hard Copies

From Your IBM-PC Files $5.00 and Up

1-800-232-5411

SlideImagers™
Atlanta, Georgia

Time/Services

EXCLUSIVE OFFERING
FREE TRIAL PERIOD—MAJOR COST SAVINGS

FULL SERVICE COMPUTER PROCESSING
IBM 3090 Processor-MVS/XA & VM/HPO, TSO, CICS

- Broad Software Support Product Line
- Domestic & International Network
- PROFS, Decision Support Products
- Data Base Management
- Banking/Financial Services

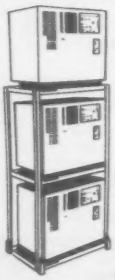
CALL 1-800-443-8797

Guaranteed Lowest Rates in the Industry
Allowances for Peak/Cyclical Processing

FINANCIAL TECHNOLOGIES
CHANTILLY, VIRGINIA

Peripherals/Supplies

Now Available from CUSTOM STRUCTURES, INC.



THREE TIER CONTROLLER STACKER SAVES PRECIOUS FLOOR SPACE

CALL
816-537-7806
or FAX
816-623-9142

Send POs to:
P.O. Box 901
Lee's Summit, Mo. 64063

CLEAR YOUR DESK!

CPU Floor Stands
$95.00
Sturdy, Attractive
Clear Acrylic
Adjustable - 4' to 7'

Atlantic Research
800/542-5323
In VA, 703/642-4131

CLASSIFIED MARKETPLACE

Where Computer Professionals Shop

(800) 343-6474
(in MA, 508/879-0700)

Computerworld's *Classified Marketplace*

showcases your ad by product category!

Whether it's used equipment, software, time, services or just about any other category of computer product or service, *Computerworld's* Classified Marketplace is organized to make your ad visible and to make buying your product easy.

Just look!

Computerworld's Classified Marketplace Product Categories

buy/sell/lease
hardware
software
communications
graphics/desktop publishing
time/services
bids/proposals/real estate
business opportunities

So if you're selling computer products or services, advertise in the newspaper that showcases YOUR product or service. Advertise in Computerworld's Classified Marketplace!

For more information, call

800/343-6474
(in MA, 508/879-0700).

INET The Quality Outsourcing Solution

Achieving 20% to 40% savings by outsourcing their information processing requirements, our clients throughout the South and Midwest receive the reliability and security of 20 years Remote Computing experience backed by a $3.5 billion corporation that offers:

- Three IBM 3090/S computers
- MVS/ESA and VM/XA Systems
- DB2 and IMS Databases
- 24-hour Technical Help Desk
- Client Disaster Recovery
- Flexible/Custom Solutions
- Fixed Price Processing
- Remote Facilities Management
- Operating Systems Conversions
- Nationwide Network

Unlike Facilities Management, you maintain control while reducing your costs and improving your service.

Information Network Corporation • Dallas, Texas • 1-800-222-1590

Bids/Proposals/Real Estate

PHOENIX LEASING

REQUEST FOR PROPOSALS

The Information Services Department of Phoenix Leasing Incorporated, 2401 Kerner Blvd., San Rafael, California 94901, will accept proposals for the acquisition of twenty laser printers over the next twelve months. These printers must 1) be compatible with the VAX/VMS environment and with Word-11 word processing software, 2) have three input trays and 3) have product support, parts inventory and source of expendable supplies local to our San Rafael site.

Request for Proposals

Request for Proposals for computer hardware, software and services for the Franklin County Board of Alcohol, Drug Abuse and Mental Health Services and their 28 contracting agencies. Release date November 21, 1989; proposals due January 5, 1990. A bid bond of 3% or $5,000 is required. Please contact: Michele Leighton, Director of MIS, Franklin County Board of Alcohol, Drug Abuse, 447 E. Broad Street, Columbus, Ohio 43215, (614) 224-1057 or Bruce W. Johnson, President, Bruce W. Johnson & Associates, Inc., Professional Computer Consultants, 802 Triangle Park Drive, Cincinnati, Ohio 45246, (513) 771-3282.

The CLASSIFIED MARKETPLACE

Reach Over 612,000 Computer Professionals When They Reach For

COMPUTERWORLD

(800) 343-6474
(in MA, (508) 879-0700)

CICS Dump Analysis Software

The Computer and Data Communications Services Agency of N.Y. is soliciting proposals for the acquisition of CICS Dump Analysis Software. To obtain a copy of the request for proposal, please call Jeff Burns at 212-240-4318. Proposals are due by December 18, 1989

MEGA GROUP, INC ANNOUNCES

OUTSOURCING ....

COMPUTING SERVICES AT LOW PRICES

Our Company can provide fixed-priced data processing services. Our services will be as good as your I.S. department at substantially lower costs. We have over 20 years of experience in the data processing industry serving a wide variety and size of companies. No company is too large or too small.

To obtain more information, please call

(609) 596-8391

Software Packaging

- Disk duplication
- All formats
- EVERLOCK copy protection
- Label/sleeve printing
- Full packaging services
- Warehousing
- Drop shipping
- Fulfillment
- 48-hour delivery
- Consultation & guidance

800-243-1515

Star-Byte, Inc.
2880 Bergey Rd. Hatfield, PA 19440

COMPUTERWORLDS's *CLASSIFIED MARKETPLACE*

Examines the issues while Computer Professionals examine your message.

Call for all the details.

(800) 343-6474
(in MA., 508/879-0700)

Time/Services

REMOTE COMPUTING AND FACILITY MANAGEMENT SERVICES

- IBM MVS/XA Environment
- DB2, IDMS/R, Model 204 and 4GLs
- Professional Support Staff
- Experienced Migration Management Team
- Full Supporting Services
  - — Media Conversion
  - — Laser and Impact Printshop
  - — Application Programming
- Simplified Pricing and Invoicing
- Technical Support — 24 Hours a Day – 7 Days a Week

May&Speh, inc.
1501 Opus Place
Downers Grove, IL 60515-5713
(312) 964-1501
For More Information
Contact: Tony Ranieri

MULTIPLE IBM 3090 MACHINES

DEDICATED OS SERVICE
TIMESHARING SERVICE
DEDICATED MACHINE SERVICE

24 Hour/7 Days a Week — Non-Stop Full-Service

Full-Service
Help Desk
Technical Services
Consulting

Resources Available

MVS/XA	TSO/ISPF
VM/XA	SAS
CMS	Telenet/Tymnet
CICS	Laser Printing
DB2	Batch Facility

Flexible Solutions: Short and Long Term
COMPETITIVE PRICES
Call Pat Holland at (212) 326-5240
RECRUIT U.S.A., INC.

MEETING THE MIS CHALLENGE

Litton Computer Services
The Outsourcing Experts

Reliability, availability, security, response time . . . Litton Computer Services delivers flexible outsourcing solutions 24-hours a day instantly and cost-effectively on advanced, large scale information processing systems.

Twenty years experience brings you:

- Fixed Price Solutions
- Nationwide Network
- Migration Specialists
- Overflow Processing
- Laser Printing and Image/Forms Design
- Operating Systems Conversions
- Integrated Financial Applications
- Remote Facilities Management
- Micro/Mainframe Applications
- Major Third Party Software Packages

Let us show you how to contain costs without losing control.

CALL 1 800 PLAN LCS (1-800-752-6527)

DATA CENTERS
Boston Los Angeles Washington, D.C.

Litton
Computer Services

ETS is looking for data entry vendors.

Can you provide 100 keying hours or more daily January through May, 1990? We also require 24-48 hour turnaround.

If you qualify, please call and/or return the coupon below by **December 1.** Continental U.S. vendors only.

Educational Testing Service

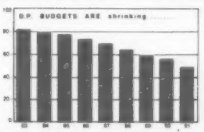
Please send coupon to: ETS
Rosedale Road, M.S. 28 N, Princeton, NJ 08541
Attn: Connie Pilla (215) 750-8377

Company _____
Name/Title _____
Street Address _____
City _____ State _____ Zip _____

NATIONAL COMPUTER SERVICES, INC.

176 W. Adams St., Suite 1700 * Chicago, Illinois 60603
Telephone 312-781-9000 * Toll-free 800-992-7171
FAX: 312-372-5157

OUTSOURCING IBM/AMDAHL USERS



WHEN COST-CUTTING GETS OVERWHELMING YOU CAN CUT COST AND IMPROVE SERVICE

OUR SERVICES AND PRICES ARE BETTER THAN ANYONE ADVERTISING IN THIS SECTION

COMMITTED TO CONTINUAL DEVELOPMENT & IMPROVEMENT OF OUR SERVICES AND PRODUCTS . . . . . TO BENEFIT YOU

NCS

FOR MORE INFORMATION
CALL JIM NEAGLE
312-781-9000
800-992-7171

ICOTECH

MVS/XA	VTAM
TSO/ISPF/SDSF	FILE-AID
CICS	INTERTEST
ADABAS	SAS
DB2	SIMWARE
ACF2	ADC2
LIBRARIAN	$AVRS

- 24 hour availability
- International access
- Superior technical support staff
- Uninterrupted Power Supply
- Certified on-site vault
- Disaster recovery
- Impeccable service

Call Now - Solve Your Computing Worries
TODAY & TOMORROW!
(201) 685-3400

REMOTE COMPUTING OUTSOURCING

- MVS/XA
- VM/370
- DOS/VSE
- CICS
- TSO
- CMS
- DB2
- IMS/DBDC

OVER 150 SOFTWARE PRODUCTS
- DEVELOPMENT
- DEBUGGING
- PRODUCTIVITY
- PERFORMANCE

- TELENET
- TYMNET
- SEARSNET
- IBM INFORMATION NETWORK

EXTRAORDINARY CUSTOMER SERVICE
MIGRATION MANAGEMENT

GIS
INFORMATION SYSTEMS, INC

815 Commerce Drive
Oak Brook, IL 60521
708-312-3636
New England
617-595-8000

COST-EFFECTIVE COMPUTING SERVICES for TODAY and ... TOMORROW

COMDISCO COMPUTING SERVICES CORP. provides you with low-cost, state-of-the-art computing services.

- IBM* CPUs and Peripherals
- Systems Software: MVS/XA, TSO/E, ISPF/PDF, CICS, VM/XA, VM/SP, HPO, CMS
- Application Software: Database Management Application Development 4/GLs Statistical Analysis Graphics
- Multiple Communications Methods
- Technical Support
- Pricing to fit your needs

IBM is a registered trademark of International Business Machines Corporation

For more information
Call Jeff Daum
201-896-2030

COMDISCO

COMDISCO COMPUTING SERVICES CORP.
P.O. Box 26
Carlstadt, NJ 07072

DATA CONVERSION

- Optical Scanning
- Disk Conversions
- Tape Conversions

Impressive Service at *Impressive* Prices!

1-800-426-3776
or
1-502-426-9448

TROPUS, Inc.
8134 New LaGrange Rd.
Suite 203, Louisville, KY 40222

COMPUTER TIMESHARING

- We locate computer time.
- We find your lowest prices.
- All mainframes.
- NEVER a charge to the Buyer.
- Our fees paid by the Seller.
- Nationwide service since 1968.

Call Don Selden at
Computer Reserves, Inc.
(201) 688-6100

VAX/VMS COMPUTER TIME

Fortran, C, Cobol, Pascal, Basic and other DEC layered products available.

Flat monthly & annual rates.

Local access for most of (213), (714), and (818).

Telenet available nationwide on larger accounts.

MedCom Info Systems, Inc.
Phone: (714)996-9999
Fax: (714)961-8700
BBS: (714)996-6666 GO VAX

NEW AND USED RAISED FLOORING

Immediate Delivery
Quality Installation

Raised Computer Floors
One Charles Street
Westwood, NJ 07675
(201) 666-8200
FAX (201) 666-3743

RGA DATA CONVERSION CENTER

Tape, disks, micros, minis, mainframes, word processors, typesetting, and more...

- Same day service
- IBM 4300 on premises
- Conversion to/from all systems
- Hundreds of conversion programs
- Customized programming
- Corporate Accounts Welcomed

(212) 995-1090
Ralph Garner Associates, Inc.
215 Park Avenue South, New York, NY 10003
Professional services since 1967

CLASSIFIED MARKETPLACE

Where Computer Professionals Shop

(800) 343-6474
(in MA; 508/879-0700)

INCOMPATIBLE COMPUTERS?

Disk Interchange Service Company specializes in transferring files between incompatible computers. Our seven conversion systems support 1000+ formats:

- 9-TRACK TAPE TO DISKETTE
- DEDICATED WORD PROCESSORS
- 3.5", 5.25" & 8" FORMATS

Additional Services Include:
- Database & Spreadsheet Conversions
- Custom Programming/Data Reformatting
- Data Entry

Disk Interchange Service Co. (DISC)
2 Park Drive • Westford, MA 01886
(508) 692-0050

INTERNATIONAL NETWORK

- COMPUTING SERVICES (IBM) VM/VSE HP3000)
- FACILITIES MANAGEMENT (IBM HP)
- CONTRACT PROGRAMMING (S/370 AS400 HP3000)

★ LOWEST PRICES ★

TRIDENT INFOTECH (USA) INC.
465 California St. Suite 415
San Francisco, CA 94104
415 433 2419

Give maintenance some respect

In training too, upkeep of systems remains the Rodney Dangerfield of IS

BY MARK DUNCAN
SPECIAL TO CW

In most information systems organizations, the two broad categories of work are development and maintenance of application software.

While the two activities are considered separate undertakings, training is thought of almost exclusively in terms of development. Also, though it is accepted that some sort of apprenticeship is a prerequisite to becoming a developer, there is an inexplicable assumption that staff members magically become adept at maintenance as soon as they are assigned the title.

The training manager faced with creating a curriculum that addresses both development and maintenance must acknowledge the differences between the two activities and understand their similarities as well.

Choosing courses to extend or hone the relevant skills is straightforward in the case of the development staff: Courses abound in structured analysis, design, coding and testing.

Rarely, however, does one encounter courses approaching these skills strictly from a maintenance perspective. Usually, the best the training manager can do is to customize development courses or create his own maintenance curriculum from scratch.

In customizing development courses, it may be feasible to break them down into parts and tailor the parts to reflect maintenance within the framework of standards, procedures and existing systems. For example, in development work, a systems analyst initially concentrates on the big picture, then progressively breaks it down to the required level of detail for design and specifications. In maintenance, the programmer examines a problem at a more detailed level, then bubbles up to higher levels to verify the soundness of his solution.

The trainer, with the help of some experienced maintenance programmers, could create canned scenarios of authentic maintenance situations relating to existing systems. At a minimum, this approach would teach familiarity with tools and techniques and provide readiness training for the real thing.

In creating a maintenance curriculum, the trainer should consider at least two areas — familiarity with existing applications and training in tools.

It is sad but often true that maintenance programmers examine and debug code they are seeing for the first time. The situation is only aggravated, of course, if it happens to be 3 a.m. and the system is a critical one.

It is probably impractical to spend time and money teaching a maintenance programmer everything about the software he supports. However, it is certainly prudent to allow time for him to become familiar with major features, perhaps by reviewing or completing unfinished documentation or exercising test scripts. The objective is to increase his comfort and confidence levels when implementing change.

Tools of the trade are a vital asset to the maintenance programmer. More often than not, time is of the essence for maintenance projects, yet accuracy can never be compromised. Interactive debuggers, file comparison utilities and test data/script generators are some of the software tools that can facilitate maintenance work. A maintenance curriculum must ensure in-depth knowledge and a high degree of fluency in the use of all such tools.

Finally, an effective training program should take into account the following considerations:

- Whereas development is generally undertaken in teams, maintenance people tend to work alone. Maintenance work thus calls for greater self-sufficiency.
- Development people generally focus on one application at a time, whereas maintenance workers must have the versatility to divide their attention among several unrelated systems.
- Development teams have structure in terms of reporting protocols, decisi -making and project management. Such procedures are frequently absent in maintenance, requiring staff members to exercise greater initiative.
- Development projects progress steadily in one direction (hopefully). Maintenance people, however, must be able to switch between tasks in an unconventional sequence.
- Development workers can gain familiarity with systems from working with them from inception to implementation. Maintenance people are frequently navigating unfamiliar waters; a sharp eye for detail is essential to help evaluate the impact of changes.

Despite the technological advances in engineering applications, we are still some distance from perfect software, so maintenance will continue to be a fact of life. This consideration alone warrants at least fair treatment with its sibling — fair treatment in money spent on new tools, new methods and training.

IT IS SAD but often true that maintenance programmers examine and debug code they are seeing for the first time. The situation is only aggravated, of course, if it happens to be 3 a.m. and the system is a critical one.

Duncan is a quality assurance consultant at a large Dallas bank.

ReXX Programming for MVS Automated Systems Operation

A 3-day intensive class.
ReXX design and development.
Includes:
demos, comprehensive labs.

New Jersey.....December 4-6, 1989
Los Angeles.....January 9-11, 1990

Register by calling Sharon at (213) 578-1147

Sponsored by: *MVS Software, Inc.*
Offered by: *Next Generation Technology, Inc.*

NATURAL 2 *Tips & Techniques*
★
NATURAL 2 *Developers Handbook*
★
NATURAL 2 *Self Study Guide*
★
Available from
WHAO
PO Box 82-335
Wellesley, MA 02181
(617) 239-0822
FAX 617-239-0827

COMPUTERWORLD'S
November 27th
Training Editorial Topic

Critical success factors and IS training

Product Spotlight: Modems and muxes

Ad Close: Nov. 21

COMPUTERWORLD'S Training Pages work!

Just ask Michael Clayville, Director of Marketing for American Training International (ATI), a Los Angeles, California, marketer of computer-based training products. For Michael, selling to America's computer training buyers is the name of the game. And to find them, he uses *Computerworld's* weekly Training Pages to generate quality sales leads. According to Michael ...

"Within two weeks after our first two ads appeared in Computerworld's Training Pages, we drew in more than 100 leads. And by the quality of them, I can tell we're getting to the right audience with the right message."

Or ask the hundreds of companies that successfully market their computer software and services to Computerworld readers. They'll tell you they advertise in Computerworld for one simple reason. It works.

To put Computerworld's Training Pages to work for you, call John Corrigan at 800/343-6474 or (in MA, 508/879-0700)

SALES OFFICES

Publisher/Fritz Landmann

Senior Vice-President/Associate Publisher,Val Landi, **COMPUTERWORLD,** 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171, (508) 879-0700

BOSTON: Regional Vice-President - North/David Peterson, Sr. District Managers/Bill Cadigan, Sherry Driscoll, District Manager/John Watts, Sales Assistants/Alice Longley, Lisa Bonaccorso, **COMPUTERWORLD,** 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700

CHICAGO: Regional Vice-President - Midwest/Kevin McPherson, Senior District Manager/Larry Craven, Sales Assistants/Kathy Sullivant, Karol Lange, **COMPUTERWORLD,** 10400 West Higgins Road, Suite 300, Rosemont, IL 60018, (312) 827-4433

NEW YORK: Regional Vice-President - East/Bernie Hockswender, District Managers/Fred LoSapio, Paula D'Amico, Sales Assistants/Linda Pipines, Patricia DeBiase, **COMPUTERWORLD,** Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 967-1350

LOS ANGELES: Regional Vice-President - West/Jan Harper, Southwestern Regional Manager/Carolyn Knox, Sales Assistant/Bev Raus, **COMPUTERWORLD,** 18808 Sky Park Circle, Suite 145, Irvine, CA 92714 (714) 261-1230

SAN FRANCISCO: Regional Vice-President - West/Jan Harper, Senior District Managers/Ernie Chamberlain, Michela O'Connor, District Manager/Alicia Saribalis, Sales Assistants/Chris Kobayashi, Nurit Zekman, Carol Lacasse **COMPUTERWORLD,** 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555

ATLANTA: Regional Vice-President - East/Bernie Hockswender, District Manager/Melissa Christie Neighbors, Sales Assistant/Debra Brown, **COMPUTERWORLD,** 1400 Lake Hearn Drive, Suite 330, Atlanta, GA 30319 (404) 394-0758

DALLAS: Regional Vice-President - Midwest/Kevin McPherson, Southeastern District Manager/Darren Ford, Sales Assistant/Brenda Shipman, **COMPUTERWORLD,** 14851 Dallas Parkway, Suite 304, Dallas, TX 75240 (214) 233 0882

WASHINGTON, D.C.: Regional Vice-President - East/Bernie Hockswender, District Manager/Paula D'Amico, **COMPUTERWORLD,** Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 967-1350

CLASSIFIED ADVERTISING SALES: Classified Advertising Director/John Corrigan, Marketing Director/Derek E. Hulitzky, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, In MA (508) 879-0700

PRODUCT CLASSIFIED ADVERTISING:
East: Account Manager/Paul Bonarrigo, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, In MA (508) 879-0700
Midwest: Account Manager/Marie Keyes, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, In MA (508) 879-0700
West: Account Executive/Bill Creonte, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, In MA (508) 879-0700

RECRUITMENT ADVERTISING SALES OFFICES:
New England: Regional Manager/Nancy Percival, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, In MA (508) 879-0700, Account Executive/Andrew Rowe, (800) 343-6474, In MA (508) 879-0700
Mid-Atlantic: Regional Manager/Warren Kolber, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 967-1350, Sr. Account Executive/Jay Novack, (800) 343-6474
South-Atlantic: Regional Manager/Katie Kress, 8304 Professional Hill Drive, Fairfax, VA 22031 (703) 573-4115, Sr. Account Executive/Pauline Smith (800) 343-6474
Midwest: Regional Manager/Pat Powers, O'Hare Corp. Twr 1, 10400 W. Higgins Rd., Ste. 300, Rosemont, IL 60018 (312) 827-4433, Account Executive/Ellen Casey (800) 343-6474
West: Regional Manager/Barbara Murphy, 18008 Skypark Circle, Ste. 145, Irvine, CA 92714 (714) 250-0164, Account Executive/Christopher Glenn (800) 343-6474

DIRECT RESPONSE CARDS:
East: Account Manager/Norma Tamburrino, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 967-1350
West: Account Executive/Jill Halbert, 18008 Skypark Circle, Ste. 145, Irvine, CA 92714 (714) 250-0164

IDG INTERNATIONAL MARKETING SERVICES:
Managing Director/Frank Cutitta, **COMPUTERWORLD,** 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700
West Coast Marketing Manager/Leslie Barner, 3350 West Bayshore Road, Suite 201, Palo Alto, CA 94303 (415) 424-1001

CW PUBLISHING/INC.

An IDG Communications Company

Fritz Landmann/President

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171
Phone: 508-879-0700, Telex: 95-1153, FAX: 508-872-8864

Senior Vice-President/Associate Publisher, Val Landi

FINANCE Senior Vice-President/Chief Financial Officer, Matthew Smith. **Controller,** Mark Sullivan.
SALES Advertising Director, Carolyn Novack. **Classified Advertising Director,** John Corrigan.
Marketing Director, Derek E. Hulitzky.
Display Advertising Production Manager, Maureen Hanley. **Classified Operations Manager,** Cynthia Delany.

MARKETING Vice President/Business Development, Kevin Harold. **Manager, Marketing Communications,** Mary Doyle. **Account Manager, Marketing Communications,** Elizabeth Phillips. **Manager, Trade Show & Conventions,** Audrey Shohan.

CIRCULATION Director of Circulation Management, Maureen Burke. **Director of Circulation Promotion,** Carol Spech.

PRODUCTION Vice President/Manufacturing, Leigh Horneth. **Assistant Production Director,** Carol Polack. **Production Manager,** Beverly Wolff. **Art Director,** Tom Monahan.

PUBLISHER'S OFFICE Assistant to the President, Karen Elliott. **Assistant to the Senior Vice-President,** Libby Levinson.

GLOBAL LEADERSHIP NETWORK

FOREIGN EDITORIAL/SALES OFFICES

ARGENTINA: Ruben Argento, CW Communicaciones S/A, Av. Belgrano 406-Piso 9, CP 1092 Buenos Aires. Phone: (011) 54 134-5583. Telex: (390) 22644 (BAZAN AR).

ASIA: S.W. Chan, Asia Computerworld Communications Ltd., 701-4 Kam Chung Bldg., 54 Jaffe Road, Wanchai, Hong Kong. Phone: (011) 852 5 861 3238. Telex: (780) 72827 (COMWOR HX). FAX: (011) 852 5 86 10953.

AUSTRALIA: Alan Power, IDG Communications Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (011) 61 2 4395133. Telex: (790) AA74752 (COMWOR). FAX: (011) 61 2 439 5512.

AUSTRIA: Manfred Weiss, CW Publikationen Vertags Ges.m.b.H., Zieglergasse 6, A 1070 Wien, Austria. Phone: (011) 43-222-93 16-31-0. Telex: (847) 115542 (SCH/A) FAX: (011) 43 222 93 05 08 33.

BRAZIL: Ney Kruel, Computerworld do Brazil Ltda., Praca Floriano, 19/26 Andar, 2031 Rio de Janeiro, RJ Brazil. Phone: (011) 55 21 240 8225. Telex: (391) 21 30830 BR. Sao Paulo: Computerworld do Brazil Ltda., Rua Joaquim Floriano, 488/3 andar-CEP 04534, Sao Paulo, Brazil. Tel: (011) 55 11 853 6149. Telex: (391) 1132017 (WORD BR).

COLOMBIA: Rodrigo Ruentes, La Nueva Ley, Transv. 42B No. 99 A/66, Apartado 58505, Bogota, D.E. Columbia. Tel: (011) 571 271 5165.

DENMARK: Preben Engell, IDG Danmark A/S, Krumtappan 4 DK-2500 Valby Denmark. Tel: (011) 45 36 442800. Telex: (855) 31566. FAX: (011) 45 36 442033.

FRANCE: Francois Chaussonniere, IDG Communications France, Immeuble La Fayette, 2, Place des Vosges, Cedex 65, 92051 Paris la Defense, France. Tel: (011) 33 1 4904 7900. Telex: (842) 613234F. FAX: (011) 33 1 4904 7800.

HUNGARY: Dezso Futasz, Computerworld Informatika Co., Kft. Pf. 386, 1536 Budapest, Hungary. Phone: (011) 36 1 228 458. Telex: (861) 226307 (KSHP H). FAX: (011) 361 423 965.

INDIA: Pradeep Gupta, Cyber Media (India) Ltd., D-74 Panchsheel Enclave, New Delhi, 110017, India. Tel: (011) 91 11 6433999. Telex: (953) 0317 1344 (INDQ IN). FAX: (011) 91 11 644 1022.

ITALY: Umberto Costamagna, Computer Publishing Group S.r.L., Via Nida 7, 20127 Milano, Italy. Phone: (011) 39-2-261 3432. Telex: (843) 335318. FAX: (011) 39 2 284 0737.

JAPAN: Dick Yamashita, IDG Communications/Japan, Kiocho TBR Bldg., 5-7 Kojimachi, Chiyodaku Tokyo 102, Japan. Tel: (011) 81 3 222 6411. Telex: (781) 252 4217. FAX: (011) 81 3 222 6566.

MEXICO: Henry Morales, Computerworld Mexico S.A. de C.V., Oaxaca 21-2, Mexico City 7 D.F. Colonia Roma, 06700 Mexico. Tel: (011) 52 5 514 4218 or 6309. Telex: (383) 177 1300 (ACHAME). FAX: (011) 525 511 4860.

THE NETHERLANDS: Wout Berends, IDG Communications B.V., de Paulus Potterstraat 18, 1071 DA Amsterdam, The Netherlands. Tel: (011) 31 20 664 6426/664 5818. Telex: (844) 18242 (CWCOM NL). FAX: (011) 3120 796 006.

NEW ZEALAND: Martin Taylor, IDG Communications Ltd., 2nd Floor, 15 Augusta Terrace, Parnell, Auckland 1, New Zealand. Phone: (011) 64-9-779-902. Fax: (011) 64 9 774 604.

NORWAY: Morten Hansen, CW Norge A/S, Hovineveien 43, 0576, Oslo 5, Norway. Phone: (011) 472 647725. Telex: (856) 76476 (CW NOR N). FAX: (011) 47 268 0152.

PEOPLE'S REPUBLIC OF CHINA: Shen Yao, China Computerworld, 74 Lu Gu Road, Box 750, Beijing 100039, People's Republic of China. Tel: (011) 47 81 0044. Telex: (716) 222214 (CCW CN).

SINGAPORE: Asia Computerworld Communications Ltd., 11-08/10 Tower Block, Gold Hill Plaza, 51 Newton Road, Singapore 1130, Republic of Singapore. Phone: (011) 65 250 4444. Telex: (786) RS 37003 (Comwon). FAX: (011) 65 250 4296.

SOUTH KOREA: Young S. Gmm, Hi Tech Information, Inc. 3rd floor, Youngsae Building, 1600-7 Seocho 3 Dong, Seochogu, Seoul 137-073 Korea. Tel: (011) 82 2 588 8922. FAX: (011) 82 2 582 9823.

SPAIN: Pico Zabala, CW Communications, S.A., Rafael Calvo, 18, 4B, 28010 Madrid, Spain. Phone: (011) 34 1 319 4014. Telex: (831) 45522 (CW E). FAX: (011) 341 319 61 04.

SWEDEN: Bengt Mannfeldt, CW Communications AB, Sodra Hamnvagen 22, S-115 41 Stockholm, Sweden. Tel: (011) 46 8667 9180. Telex: (854) 14904 9 (NOVACW). FAX: (011) 46 8665 3132.

SWITZERLAND: Gebhard Ostenwalder, CW Publikationen AG, Witikonerstrasse no. 15, Postfach 253, CH - 8030 Zurich, Switzerland. Phone: (011) 41 1 55 10 77. Telex: (845) 816 710 (CWCI CH). FAX: (011) 41 1 55 1135.

TAIWAN: David Chu, IDG Communications/Taiwan, 4F-2, No. 137, Fu Hsin South Road, Sec. 1 Taipei, Taiwan, Tel: (011) 886 2777 5335. FAX: (011) 886 2777 5339.

LONDON: Martin Durham, CW Communications Ltd., 99 Grays Inn Rd., London, WC1 8UT, United Kingdom. Phone: (011) 44 1 831 9252. Telex: (851) 262346 (THEPUB G). FAX: (011) 44 1 405 2347.

UNITED KINGDOM: Colin Smith, Oliver Smith & Partners, 18 Abbeville Mews, 88 Clapham Park Road, London SW4 7BX, United Kingdom. Phone: (011) 44-1-978-1440. FAX: (011) 44-1-978-1550.

VENEZUELA: Kalman von Vajna Nagy, IDG Communications C.A., C.R.L. Torre Maracaibo, Piso 13, Oficina H, Av. Libertador, Caracas, Venezuela. Phone: (011) 58 2 72 76 30. FAX: (011) 58 2 724970.

WEST GERMANY: Eckhard Utzadel, IDG Communications Verlag AG, Rheinstrasse 26/86, Postfach 40 04 29, 8000 Munich 40, West Germany. Phone: (011) 49 89 360860. Telex: (841) 5215350. (COMW D). FAX: (011) 49 89 3 60 86 11 76.

IDG COMMUNICATIONS/INC.

Patrick J. McGovern	Axel Leblois	Walter Boyd	William P. Murphy
Board Chairman	Vice-Chairman	President	Vice President/Finance

Computerworld is a publication of IDG Communications, the world's largest publisher of computer-related information. IDG Communications publishes over 120 computer publications in 40 countries. Fourteen million people read one or more IDG Communications publications each month. IDG Communications publications contribute to the IDG News Service offering the latest on domestic and international computer news. IDG Communications publications include: ARGENTINA'S *Computerworld Argentina;* ASIA'S *Computerworld Asia;* AUSTRALIA'S *Computerworld Australia, Communications World, Australian PC World, Australian Macworld;* AUSTRIA'S *Computerwelt Oesterreich;* BRAZIL'S *DataNews, Mundo IBM, PC Mundo;* CANADA'S *Computer Data;* CHILE'S *Informatica, Computacion Personal;* COLUMBIA'S *Computerworld Columbia;* DENMARK'S *Computerworld Danmark, PC World Danmark, CAD/CAM World;* FINLAND'S *Mikro PC, Tietovikko;* FRANCE'S *Le Monde Informatique, Distributique, InfoPC, Telecoms International;* HUNGARY'S *Computerworld SZT, Mikrovilag;* INDIA'S *Dataquest, PC World India;* ISRAEL'S *Macintosh, People & Computers Monthly, People & Computers Weekly;* ITALY'S *Computerworld Italia;* JAPAN'S *Computerworld Japan, Infoworld, Publish;* MEXICO'S *Computerworld Mexico, PC Journal;* THE NETHERLANDS' *Computerworld Netherlands, PC World Benelux;* NEW ZEALAND'S *Computerworld New Zealand;* PEOPLE'S REPUBLIC OF CHINA'S *China Computerworld, PC World China;* SOUTH KOREA'S *Computer Korea;* SPAIN'S *Cimworld, Computerworld Espana, Commodore World, PC World Espana, Comunicaciones World;* SWEDEN'S *Computer Sweden, MikroDatorn, Svenska PC World;* SWITZERLAND'S *Computerworld Schweiz;* TAIWAN *Computerworld Taiwan, PC World Taiwan;* UNITED KINGDOM'S *Communications News, DEC Today, ICL Today, Lotus, Macworld, PC Business World;* UNITED STATES' *Amiga World, CIO, Computerworld, Digital News, Federal Computer Week, Focus Publications, Game Pro, InCider, InfoWorld, Macworld, Network World, PC Games, PC Letter, PC World, Portable Computer Review, PC Resource, Publish!, Run;* U.S.S.R. *PC World U.S.S.R.;* VENEZUELA'S *Computerworld Venezuela, Micro Computerworld Venezuela;* WEST GERMANY'S *Computerwoche, PC Welt, PCWoche.*

ADVERTISERS INDEX

Adobe Systems Inc	112
ADP	46
Attachmate	110
AT&T	21, 74-75, 81, 83, 100
BASF	106
Beta Systems Software	31
BI Moyle	101
Businessland	32-33
Cambex Corp	40
Candle Corp	34
Centura Software (formerly Application Development Systems)	26
Cipher Data	98
Codex Corp	52
Command Technology	63
Communication Networks '90	20
Computer Associates	5, 10
Computerland Corp	27
CW Circulation	134
Data General Corp	28-29
Datapoint	14-15
DCA	90
Dell Computer	78-79
Digital Equipment Corp	24-25
Eastman Kodak	44
EMC Corp	94
Fujitsu Ltd	104-105
GTE	113
Hewlett-Packard	16-17
IBM Corp	36-37, 60-61, 108-109
IDC Corp	96
Inference Corp	107
Information Builders	30
Information Dimensions	58-59
Interface Systems	35
Leasametric	114
McData Corp	69-71
MCI Corp	86
Micro Focus	51
Microcom	97
MSA	C4
Multi-Tech Systems	82
NCR Corp	19, 42-43, 88-89
NEC	C3
Next Computer	12-13
Northern Telecom	116
Novell, Inc	48-49, 54-55
Oracle Corp	9, 11
Progress Software	57
Racal Milgo	80
Relational Technology	39, 41
Ross Systems	111
SAS Institute	115
Software 2000	56
Syncsort	3
Systems Center Software	7
3Com	102-103
3M Corp	38, 66-67
Televideo	92
Texas Instruments	72-73
Unisys	64-65
Universal Data Systems	76
Vitalink	68
Wollongong Group	47
Wyse Technology	50
XA Systems	84
XDB Systems	53
Xidex	91, 93, 95

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Have A Problem With Your Subscription?

We want to solve it to your complete satisfaction, and we want to do it fast. Please write to:

COMPUTERWORLD, P.O. Box 2043, Marion, Ohio 43305-2043.

Your magazine subscription label is a valuable source of information for you and us. You can help us by attaching your magazine label here, or copy your name, address, and coded line as it appears on your label. Send this along with your correspondence.

Address Changes or Other Changes to Your Subscription

All address changes, title changes, etc. should be accompanied by your address label, if possible, or by a copy of the information which appears on the label, including the coded line. Please allow six weeks for processing time.

Your New Address Goes Here

Name

Company

Address

City State Zip

Address shown: ☐ Home ☐ Business

Name
Title
Company
Address
City State Zip

Other Questions and Problems

It is better to write us concerning your problem and include the magazine label. Also, address changes are handled more efficiently by mail. However, should you need to reach us quickly the following toll-free number is available:

1-800-669-1002

Outside U.S. call: (614) 382-3322

COMPUTERWORLD

P.O. Box 2043, Marion, Ohio 43305

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, NOV. 15, 1989

E X C H		52-WEEK RANGE		PRICE CLOSE NOV. 15, 1989	WEEK NET CHNGE	WEEK PCT CHNGE

Communications and Network Services

N	AMERICAN INFO TECHS CORP	65	46	59.75	-1.6	-2.6
Q	ANDREW CORP	26	17	24	-0.3	-1.0
Q	ARTEL COMM CORP	9	2	6	0.4	6.7
N	AT&T	46	27	43.375	-0.9	-2.0
Q	AVANTEK INC	7	4	4.75	-0.1	-2.6
N	AYDIN CORP	21	14	18.625	-1.9	-10.1
N	BELL ATLANTIC CORP	105	69	103.875	1.6	1.6
N	BELLSOUTH CORP	55	39	51.75	-0.1	-0.2
Q	COMPRESSION LABS INC	11	3	7.75	-0.6	-7.5
Q	CONTEL CORP	37	18	30.5	0.4	1.2
Q	DATA SWITCH CORP	6	2	2.75	-0.1	-4.3
Q	DIGITAL COMM ASSOC	26	17	19.5	1.0	5.4
Q	DYNATECH CORP	21	16	17	0.0	0.0
Q	FIBRONICS INTNL INC	7	3	6.5	0.1	2.0
Q	GANDALF TECHNOLOGIES	7	4	5.25	-0.1	-2.3
Q	GENERAL DATACOMM INDS	7	4	4.375	-0.5	-10.3
N	GTE CORP	67	42	66.625	0.4	0.6
Q	INFOTRON SYS CORP	13	9	8.5	-0.3	-2.9
N	ITT CORP	65	48	58.125	-0.3	-0.4
N	M/A COM INC	9	6	5.625	-0.4	-6.3
Q	MCI COMMUNICATIONS CORP	49	20	44.25	1.5	3.5
N	NETWORK EQUIP TECH INC	28	14	28.125	0.0	0.0
Q	NETWORK SYS CORP	11	7	8.25	0.4	4.8
N	NORTHERN TELECOM LTD	23	14	22	0.1	0.6
Q	NOVELL INC	38	24	24.875	-1.1	-4.3
N	NYNEX CORP	84	65	80	2.3	2.9
N	PACIFIC TELESIS GROUP	47	29	44.125	1.9	4.4
A	PENRIL CORP	9	3	7.375	0.0	0.0
N	PLESSEY PLC	45	37	39.375	0.0	0.0
N	SCIENTIFIC ATLANTA INC	25	11	24.75	3.6	17.2
N	SOUTHWESTERN BELL CORP	59	39	55.625	0.5	0.9
Q	3 COM CORP	29	10	11.75	0.3	2.2
N	US WEST INC	75	55	71.25	1.6	2.3

Computer Systems

Q	ALLIANT COMPUTER SYS	7	3	5.875	-0.1	-2.1
Q	ALPHA MICROSYSTEMS	8	5	5	0.0	0.0
Q	ALTOS COMPUTER SYS	9	6	7.75	-0.1	-1.6
A	AMDAHL CORP	23	11	11.25	0.0	0.0
Q	APPLE COMPUTER INC	50	34	44.25	-0.8	-1.7
N	BOLT BERANEK & NEWMAN	13	6	6.375	-0.4	-5.8
N	COMPAQ COMPUTER CORP	113	52	91	-1.8	-1.9
Q	COMMODORE INTNL	20	7	7.25	-0.1	-1.7
Q	COMPUTER AUTOMATION INC	7	2	2.375	-0.4	-13.6
N	CONTROL DATA CORP	24	16	17.5	-0.5	-2.8
Q	CONVEX COMPUTER CORP	16	9	14.875	0.6	4.4
N	CRAY RESH INC	66	33	32.875	-2.0	-5.7
Q	DAISY SYS CORP	7	1	0.813	-0.3	-23.5
N	DATA GEN CORP	20	13	13.75	0.1	0.9
N	DATAPOINT CORP	6	3	3.875	0.0	0.0
Q	DELL COMPUTER CORP	12	5	5.625	0.3	4.7
N	DIGITAL EQUIP CORP	122	84	85.25	-1.8	-2.0
N	FLOATING POINT SYS INC	4	1	1.5	-0.1	-7.7
N	HARRIS CORP	40	25	35.875	1.1	3.2
N	HEWLETT PACKARD CO	62	40	41.125	-1.3	-2.9
N	HONEYWELL INC	92	57	80.75	-0.8	-0.9
N	IBM	131	98	97.875	1.1	1.2
Q	INFORMATION INTL INC	16	12	13	0.8	6.1
Q	IPL SYS INC	9	4	7.125	0.3	3.6
N	MAI BASIC FOUR INC	12	3	3.375	-0.1	-3.6
N	MATSUSHITA ELEC INDL LTD	204	158	158.5	-0.8	-0.5
Q	MENTOR GRAPHICS CORP	22	12	15.25	-0.8	-4.7
N	MBI INC	3	1	0.625	-0.1	-9.2
N	NCR CORP	67	51	60.375	0.6	1.0
N	PRIME COMPUTER INC	21	7	7.25	-0.4	-4.9
Q	PYRAMID TECHNOLOGY	20	9	16.5	-0.3	-1.5
Q	SEQUENT COMP SYS INC (S)	19	8	18.125	-16.6	-47.8
Q	SHAREBASE CORP	4	0	0.563	0.1	12.6
Q	SILICON GRAPHICS CORP	27	14	22.5	-1.3	-5.3
Q	STRATUS COMPUTER	35	21	23.25	0.3	1.1
Q	SUN MICROSYSTEM INC	23	13	15.625	-0.9	-5.3
Q	SYMBOLICS INC	3	1	1.5	-0.1	-6.0
N	TANDEM COMPUTERS INC	28	15	24.25	0.0	0.0
N	TANDY CORP	49	38	41.25	-0.8	-1.8
N	ULTIMATE CORP	12	7	8.125	0.3	3.2
N	UNISYS CORP	31	12	13.375	-1.1	-7.8
A	WANG LABS INC	11	5	5.375	0.0	0.0

Software & DP Services

Q	ADOBE SYS INC	30	14	17.75	2.3	13.6
Q	AMERICAN MGMT SYS INC	19	11	13.25	0.0	0.0
Q	AMERICAN SOFTWARE INC	23	9	22.125	0.3	1.1
N	AMACOMP INC	9	4	4.75	-0.3	-5.0
Q	ANALYSTS INTL CORP	20	8	17.5	-0.3	-1.4
Q	ASHTON TATE	25	9	9.625	-0.6	-6.1
Q	ASK COMPUTER SYS INC	18	7	7.375	0.0	0.0
N	AUTO DATA PROCESSING	51	38	46.875	1.1	2.5
Q	AUTODESK INC	44	23	39	0.8	2.0
Q	BMC SOFTWARE INC	28	9	27.375	2.1	8.4
N	BUSINESSLAND INC	15	9	9.5	0.3	2.7
Q	COGNOS INC	9	4	4.25	-0.1	-2.9
N	COMPUTER ASSOC INTL INC	22	11	12	1.4	12.9
Q	COMPUTER HORIZONS CORP	11	7	8.375	-0.1	-1.5
N	COMPUTER SCIENCES CORP	56	44	54.125	2.6	5.1
N	COMPUTER TASK GROUP INC	16	10	10.25	-0.4	-3.5
Q	COMSHARE INC	42	15	33.25	0.0	0.0
Q	CORPORATE SOFTWARE	16	9	9.5	-0.5	-5.0
N	GENERAL MTRS (CLS E)	58	39	57.125	2.1	3.9
Q	HOGAN SYS INC	7	4	5	0.0	0.0
Q	INFORMIX CORP	15	7	14	1.1	8.7
Q	INTELLICORP INC	6	3	4.625	-0.3	-5.1
Q	LEGENT CORP	32	18	25.75	-0.6	-2.4
Q	LOTUS DEV CORP	34	17	30.875	-1.6	-5.0
Q	MANAGEMENT SCI AMER	12	7	11.75	1.5	14.6
Q	MICROSOFT CORP	89	45	86.5	5.5	6.8
Q	NATIONAL DATA CORP	35	19	31.75	0.3	0.8
N	ON LINE SOFTWARE INTL INC	9	5	8.875	0.6	7.6
Q	ORACLE SYS CORP	26	8	25	1.4	5.8
Q	PANSOPHIC SYS INC	18	12	14.875	1.8	13.3
Q	PHOENIX TECHNOLOGIES INC	19	3	3.875	0.1	3.3
Q	POLICY MGMT SYS CORP	38	22	36.75	3.3	9.7
Q	PROGRAMMING & SYS INC	21	15	20.75	0.8	3.8
Q	RELATIONAL TECH INC	16	5	6.125	-0.4	-5.8
N	REYNOLDS & REYNOLDS CO	34	20	24.75	0.0	0.0
Q	SAGE SOFTWARE INC	11	7	9.5	0.0	0.0
Q	SEI CORP	20	16	18.125	-0.1	-0.7
Q	SHARED MED SYS CORP	19	13	13.375	-0.1	-0.9
Q	SOFTWARE PUBG CORP	31	18	24.125	-1.9	-7.2
A	STERLING SOFTWARE INC	9	5	7.625	0.1	1.7
Q	SUNGARD DATA SYS INC	22	13	21.875	1.8	8.7
Q	SYSTEMATICS INC	40	28	34.25	0.3	0.7
N	SYSTEM CENTER INC	26	14	16.5	-0.3	-1.3
N	SYS. SOFT INC	30	14	28	0.8	3.0
Q	WORDSTAR	3	2	1.875	-0.1	-6.3

Semiconductors

N	ADV MICRO DEVICES INC	11	7	7.5	0.1	1.7
N	ANALOG DEVICES INC	13	9	8.625	-0.1	-1.4
Q	ANALOGIC CORP	11	7	9.375	-0.3	-2.6
Q	CHIPS & TECHNOLOGIES INC	26	11	19.25	-1.6	-7.8
Q	INTEL CORP	35	19	33.75	2.0	6.3
N	MICRON TECHNOLOGY INC	26	10	11.5	0.8	8.2
N	MOTOROLA INC	63	39	56.5	2.0	3.7
N	NATL SEMICONDUCTOR	10	7	6.625	-0.5	-7.0
N	TEXAS INSTRS INC	47	29	29.75	-0.9	-2.9
A	WESTERN DIGITAL CORP	15	6	6.875	0.1	1.9

Peripherals

Q	ALLOY COMP	3	1	1.563	0.1	4.2
N	AM INTL INC	6	5	5.375	0.5	10.3
Q	AST RESH INC	11	7	9.75	-0.1	-1.3
Q	AUTO TROL TECH CORP	6	4	3.75	0.0	0.0
Q	BANCTEC INC	20	9	14.625	-0.1	-0.8
Q	CIPHER DATA PRODS INC	11	4	4.875	-0.4	-7.1
A	COGNITRONICS CORP	8	2	6.5	-0.5	-7.1
Q	CONNER PERIPHERALS	16	7	13	-0.1	-1.0
A	DATAPRODUCTS CORP	16	8	8.125	-0.4	-4.4
A	DATARAM CORP	12	7	8.625	-0.1	-1.4
N	EASTMAN KODAK CO	52	41	42.625	0.3	0.6
N	E M C CORP MASS	6	3	4.125	0.1	3.1
Q	EMULEX CORP	12	5	6.5	0.0	0.0
Q	EVANS & SUTHERLAND	25	14	23	2.3	10.8
Q	ICOT CORP	3	1	1.375	-0.1	-8.3
Q	INTERLEAF INC	10	5	8.125	-0.1	-2.0
Q	IOMEGA CORP	5	2	3.188	0.0	0.0
Q	LEE DATA CORP	4	1	1.5	0.0	0.0
Q	MASSTOR SYS CORP	4	2	2.375	-0.1	-5.0
Q	MAXTOR CORP	12	7	10.125	0.4	3.8
Q	MICROPOLIS CORP	9	3	4	0.1	3.2
Q	MINISCRIBE CORP	9	1	1.281	-0.2	-14.6
N	MINNESOTA MNG & MFG CO	80	59	74.5	0.9	1.2
Q	PERSONAL COMP PRODUCTS INC	6	4	4.25	0.0	0.0
Q	PRIAM CORP	2	0	0.063	0.0	-33.0
Q	PRINTRONIX INC	10	7	10.375	0.3	2.5
N	QMS INC	12	6	10.5	0.0	0.0
Q	QUANTUM CORP	17	4	11.5	0.1	1.1
N	RECOGNITION EQUIP INC	13	6	6.5	-0.1	-1.9
Q	REXON INC	8	6	6.375	-0.5	-7.3
Q	SEAGATE TECHNOLOGY	16	7	13.375	0.9	7.0
N	STORAGE TECH CORP	23	9	12.625	-0.4	-2.9
Q	TANDON CORP	2	0	0.938	-0.1	-6.2
N	TEKTRONIX INC	24	16	16.875	-0.8	-4.3
Q	TELEVIDEO SYS INC	1	0	0.438	0.1	16.8
N	XEROX CORP	69	54	57.625	0.9	1.5

Leasing Companies

Q	AMPLICON INC	115	11	11.5	-0.4	-3.2
N	CAPITAL ASSOC INTNL INC	9	4	4.375	0.0	0.0
N	COMDISCO INC	34	19	24.875	-1.9	-7.0
Q	CONTINENTAL INFO SYS	3	0	0.375	-0.2	-33.4
Q	LDI CORPORATION	18	12	17.25	0.0	0.0
Q	PHOENIX AMERN INC	5	3	3.625	-0.1	-3.3
Q	SELECTERM INC	9	5	6.875	0.1	1.9

EXCH: N—NEW YORK; A—AMERICAN; Q—NATIONAL; S—SPLIT

Don't fool . . .

Uncle Sam's scrutiny of IBM's Navy contracts stifles shares

Second only to Mother Nature, it's not nice to fool Uncle Sam. IBM, which is under fire for alleged procurement contract irregularities in its dealings with the U.S. Navy, watched its stock drop 1 point to a Thursday close of 97⅛.

It also seems to be a bad move to indicate to Uncle Sam that shoring up his competitive position falls below your highest priorities. Unisys Corp. and Sun Microsystems, Inc. each declined to join U.S. Memories, Inc., the recently launched microchip consortium; both suffered sharp stock declines. Unisys dropped 1½ points to close at 14⅞, and Sun finished at 15⅝, down 1 point. Compaq Computer Corp. fell 2¼ points to close at 89⅞.

Despite analysts' optimistic views of the compact-disc (CD) industry, two CD leaders finished the week in the doldrums. Apple Computer, Inc. slipped 2 points to close at 44¾, and Lotus Development Corp. ended at 30⅞, down 1⅜ points.

Microsoft Corp., which is working with IBM to make OS/2 more attractive to users (see story page 1), climbed 3 points to close at 87½. Computer Associates International, Inc. also finished strong, adding 1¾ points to close at 12⅝.

JOSEPH J. FATTON

BART

FROM PAGE 1

audit is in progress by LS Transit Systems, Inc. While findings have not been released, Smith said the auditor is "not pleased," with the system's performance. LS Transit refused to comment.

The software was written for a Data General Corp. MV 10000, which was purchased by BART in 1984 for the scheduling application.

Logica wrote the software under the MV 10000's AOS/VS operating system. According to Logica, the project was begun in 1987.

Testing was conducted on Nov. 10 from 1 a.m. to 8 a.m. with 29 trains running on BART's 72 miles of track. Logica estimated it could run 74 trains using 83% of the CPU, according to Ben Auxer, manager of the BART project at Logica.

The results of initial testing last month on 10 trains led BART engineers to believe the 74-train load would require 130% of CPU capacity.

Sidetracked

The transit system has plans, set to begin next year, to run extensions to its current lines and schedule 108 trains on the system. Smith and Nello Bianco, who is also a BART board member, said they were under the impression that the software was supposed to handle the expanded scheduling demand.

Logica representatives said that only the 74 trains were specified in their contract.

Bianco called the system a "complete failure." He said the board made a decision in 1978 to scrap its current system, based on Westinghouse Electric Corp. CPUs, which can only handle 64 trains.

"We spent $40 million to get us 10 more trains. Once we do the extensions we'll either have to go back to scratch or pour more money into it," Smith said.

However, BART's Steiner paints a more glowing picture about the project he heads. Steiner said he believes the software will support the 74-train requirement and offer significant additional features such as a color graphics display of each train.

Steiner said one reason the tests took up so much CPU capacity is that the system contained tracing mechanisms to find software faults. The system will use less CPU capacity in real-life applications when that overhead is removed, he said.

Logica's Auxer said that the software could be expanded and run on a larger DG processor, but "there are no negotiations for continuing work."

There has been no decision on whether the system will be put into production.

Weak system link brought down stock exchanges

BY ELLIS BOOKER
CW STAFF

NEW YORK — A pair of older computer systems that could not be quickly switched to emergency power during a fire caused the one-hour delay in the opening of the American and New York Stock Exchanges nearly two weeks ago.

The incident points to a truism among disaster recovery specialists, who say disasters invariably strike the most vulnerable part of an information system.

Officials at the Securities Industry Automation Corp. (SIAC) decided to switch on emergency diesel power after a fire began in an electrical vault in their building. SIAC, jointly owned by the two exchanges, is the industry's data processing arm.

Although the Friday morning fire did not damage SIAC computer equipment, one key system required at least a 30-minute controlled shutdown in order to switch to emergency power. Other computers used by SIAC contain integral batteries and can come on-line almost immediately.

SIAC plans to have its own backup facility in Brooklyn operational by the end of 1991. The facility, which will be on a different power grid from the Manhattan computer center, will share day-to-day processing applications through a redundant network, according to a SIAC spokeswoman.

While disaster recovery firms can back up a stock exchange computer room, they are not prepared to back up a trading floor.

Comdisco Disaster Recovery Services, Inc. (CDRS) will open a trading floor backup center in Brooklyn in January. The CDRS facility is being constructed in conjunction with the Republic National Bank of New York. It will feature quote services and three 10-position desks for up to 30 trader positions.

Eight garner IS impact awards

AMS, Carnegie-Mellon honor technology chiefs in variety of businesses

BY AMY CORTESE
CW STAFF

NEW YORK — Technology is great, but it takes people with a vision to put it to strategic use.

Eight of those people were honored last week by American Management Systems, Inc. and Carnegie-Mellon University's Graduate School of Industrial Administration. The winners of the Third Annual Awards for Achievement in Managing Information Technology went to information systems executives who have had an impact on their business, whether it be banking or jeans:

• Jane E. Bailey is popular in the Commonwealth of Virginia. As director of information systems for that state, Bailey implemented a tax system that now allows many taxpayers to receive refunds within five days of filing, rather than the eight to 10 weeks required under the old system.

Under Bailey's guidance, the Department of Taxation's labor-intensive operations were transformed into a computer-driven process that is a national model. The Virginia State Tax Accounting and Reporting System has contributed an estimated $77 million in cost reductions and additional revenue collections in 1988. The project cost a relatively low $11 million and involved commonwealth employees rather than contractors.

• When it comes to vision, people with bank accounts can thank Paul F. Glaser for his pioneering view that customers should have round-the-clock access to their money. Glaser, who is chairman of Citicorp's Corporate Technology and Technology Operating Committees and the bank's chief technologist, helped make automatic teller machines (ATM) a way of life.

Citicorp was among the pioneers of the ATM idea in the early 1980s and saw its share of the New York City retail branch market surge from 4% to over 13%. Since then, Glaser has developed a second generation of ATMs. Installed in 1988, the multilingual, user-friendly ATMs have resulted in a 50% increase in usage.

• Another recipient in the banking industry, James C. Grant, executive vice-president in charge of systems and technology at the Royal Bank of Canada, was praised by his own boss. "Under Mr. Grant's direction, we have been able to change the mind-set that technology is only a tool to control costs to a view that it is an enabler of strategic advantage," said John E. Cleghorn, president of Royal Bank.

Grant was honored for his record of achievement and leadership in his 20 years with Canada's largest bank. Among his projects that have sought to integrate technology with business thinking have been executive training programs and several technology initiatives for improving customer service.

• R.W. Eaton, senior vice-president and chief information officer at Levi Strauss & Co., was honored for his role in spearheading development of a computerized system designed to assist retailers trading with Levi Strauss.

"Levilink," as the system is called, speeds up and simplifies transactions from ordering to paying for Levi's products. Eaton was the driving force behind Levilink, which is said to be the first "quick response" system of its kind for the apparel industry. He is credited with gaining support for the new system and leading an effort to determine standards such as electronic data interchange formats to be used.

• G. Nichols Simonds, executive director of MIS at Chrysler Corp., was honored for his involvement with Chrysler's Service Bay Diagnostic system (SBD), a computerized diagnostic system for dealerships. Not only is the system projected to save Chrysler over $10 million annually in warranty costs, but Chrysler believes it will improve customer satisfaction. Despite intense cost pressures, Simonds was able to sell top management on the idea and enlist corporatewide cooperation to make it a reality.

Honorable mention went to Louis A. Herman, associate dean at Waubonsee Community College near Chicago; J. Braxton Vick Jr., senior vice-president of corporate services at Carolina Freight Carrier Corp.; and Barry R. Wentland, head of engineering computer applications and development at Tyndall Air Force Base in Florida.

And the winners are . . .

Recipients of the *Third Annual Awards for Achievement in Managing Information Technology, granted by American Management Systems and Carnegie-Mellon University, were (from left) Chrysler's G. Nichols Simonds, Citicorp's Paul F. Glaser, the Virginia Department of Taxation's Jane E. Bailey, Levi Strauss' R. W. Eaton and the Royal Bank of Canada's James C. Grant*

Soviet

FROM PAGE 1

the Soviet Union also made moves last week to lift curbs on travel and emigration to the West. Millions of people, mostly East Germans so far, have begun crossing the Iron Curtain for reunions with relatives and to go on shopping sprees.

However, as these heady days of celebration end, East European government and business leaders will have to turn their attention to laying a technological foundation on which they can rebuild.

More, better-managed computer systems, in particular, are seen as key to economic revival. "Everyone fears a recession," said Daniel Bardossy, vice-president at personal computer clone maker Muszertechnika in Budapest. "But most Hungarian companies see that to get out of that situation they need good information systems."

"The companies [of Eastern Europe] will be hell-bent on restructuring," said Helgard Wienert-Cakim, an expert on East-West technology transfer at the Paris-based Organization for Economic Cooperation and Development. "Computers will be crucial."

The problems facing the IS professionals choosing to remain are monumental.

Seymour Goodman, director of a group studying IS in Eastern Europe at the University of Arizona, said that "uncertainty and chaos" caused by the economic changes are sending IS specialists in Eastern Europe "scrambling."

To start, economic reform is shaking current thinking on organizational management to the core.

"Now we will have other organizational structures and other mechanisms for planning and control," said Bernd Matthes, IS management consultant and researcher at the Institute of Economics in East Berlin. "We have to learn how to manage information systems under these new and changing conditions."

"No one knows what kind of organizations are going to emerge," said Gary Geipel, an analyst in Goodman's group. "It's very difficult to develop an MIS concept when you don't know what organizational structure there will be."

East European companies also suffer from a dearth of skilled IS staff. "Our main problem is that the number of specialists in information systems management is too low," Matthes said.

Ervin Kovacs, managing director of the training center at Budapest-based Szamalk, Hungary's largest software and services company, estimates that the demand for his six-semester program is three to five times above the possible enrollment level.

In addition, the inferior quality of computer equipment made by indigenous manufacturers seriously limits the ability of IS professionals to develop adequate skills and advanced applications.

"Many computers made locally are so unreliable," said Goodman, "you couldn't run a company on them."

As a result, Eastern European business executives are beginning to clamor for more powerful and dependable computers. "With the market economy growing," Kovacs said, "customers are showing more sensitivity to price/performance. It will be more difficult to sell products that are 10 or more years behind the world level."

To meet the demand, local companies are redoubling their efforts to import products made in the U.S., Western Europe and Asia.

Strapped for the hard currencies they need to buy Western equipment, Hungary and Poland have focused on selling software and services to the West. Szamalk is training 8,000 students annually, many of whom it hopes will do software development under contract in Western countries.

Acknowledging that many may choose not to return, Kovacs nonetheless said that he believes open borders are worth the risk.

Those who leave may have second thoughts later. Goodman believes that many of those now emigrating will return within a few years, frustrated by the outcome of their flight west. "A lot of these people are going to be disappointed because they don't have the right skills to work in a competitive western company," he said.

Barilov agreed. "Like a wave," he said, "it will come back."

> "THE COMPANIES [of Eastern Europe] will be hell-bent on restructuring. Computers will be crucial."
>
> HELGARD WIENERT-CAKIM
> ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT

OS/2

FROM PAGE 1

closer together on a number of key issues," said Michele Preston, who follows personal computer systems companies for Salomon Brothers, Inc. in New York. "That has to be good for customers."

One user who is making a substantial investment in OS/2 agreed. "This is a big plus. It shows they are still trying to walk together with OS/2," said David Flaxman, vice-president of the Advanced Technology Group at Goldman Sachs & Co.

Flaxman lauded statements of direction concerning the future of Windows. "We recently registered our unhappiness [with Microsoft] about the public image that Windows might be a longer-term viable option to OS/2," he said. "We're heavy users of Windows, but we're trying to make a reasonable migration to OS/2."

Reassured Gates, "In time, there will be a substantial division between DOS and OS/2 applications."

However, IBM's long-rumored endorsement of Windows infuriated some developers who have sunk millions of dollars into development for Presentation Manager because they expected it would be the only interface blessed by IBM.

And while the unbundling of OS/2 Extended Edition should calm user fears about being locked into IBM hardware, it raised some questions about the future of Microsoft's SQL Server and Communications Manager directions.

Among the specifics of the announcement were the following:

- IBM will endorse Windows. In return, Microsoft will stop Windows enhancements with Release 3.0 and will define clear limits on future Windows capabilities. The move should appease developers who had feared Microsoft would continue to enhance Windows indefinitely.
- IBM will halt its move toward proprietary implementations of OS/2 and OS/2 LAN Manager and instead endeavor to stay in step with Microsoft's development efforts.
- IBM will unbundle its Data Base Manager and Communications Manager components from OS/2 Extended Edition. It has not yet determined how these pieces will be made available.

This is critical because IBM's Officevision plans call for Extended Edition on every desktop. Yet users have balked at Extended Edition's memory requirements, estimated at somewhere between 8M and 12M bytes.

- IBM and Microsoft will continue — albeit with renewed vigor — efforts to reduce the size of OS/2. The latest version takes up 3M bytes of memory, down from the original 4M bytes, and a 2M-byte version may be possible in 1990.

How do you spell . . .

The promise of a slimmed-down OS/2 is a "relief," Flaxman said. While the memory requirements are not a showstopper, "they do make you think twice, especially times 500 workstations," he said.

User confusion was heightened in recent weeks by Lotus Development Corp.'s decision to leak information on the so-called PM Lite, which would have provided users with the option of running a subset of Presentation Manager calls under MS-DOS [CW, Oct. 30].

"[Lotus] thought they could hurt Windows by letting PM Lite get out, but it just made it easier for Microsoft to get what it wanted," said J. Paul Grayson, chairman and CEO of Micrografx, Inc., developers of graphical software.

Lee Reisweig, director of software strategy for IBM's Entry Systems Division, admitted IBM "considered PM Lite as an option, but we have no plans to do it."

"PM Lite would have impacted Windows and left Microsoft in a position where it would have lost overall control over OS/2 code," said Tim Bajarin, an analyst at Creative Strategies Research International, Inc. in Santa Clara, Calif.

Having agreed to unite their OS/2 code, IBM moved to establish OS/2 as the platform of choice for software development. IBM's James A. Cannavino, vice-president and general manager, Personal Systems, said that by the end of 1990, all graphical applications will come out on OS/2, and later on DOS.

"Windows will not become an SAA system," he added, "although it will be upgraded with the look and feel of SAA systems." Systems Application Architecture (SAA) is IBM's way of making its diverse product lines look and feel the same.

Analysts said the announcement appeared to be driven by IBM, which has staked its PC future on OS/2. "Microsoft protected their interface at the expense of the communications and database part of their business," said Bahar Gidwani, a Microsoft analyst for Kidder, Peabody & Co. in New York.

Microsoft executives discounted speculation of a trade but conceded that IBM gained in key areas. "We will continue to compete in SQL and communications, and [IBM] is in a stronger position than they were as a result of this announcement," said Steve Ballmer, vice-president of systems software at Microsoft.

In fact, the announcement was short on specifics. Executives from both companies refused to comment on the time frame for development of most major products or the amount of time they had spent negotiating their respective endorsements. The one exception was the announcement that the two companies would offer an identical 32-bit development tool kit to developers by the end of the year and to end users by the second half of 1990.

Observers say pact hides anger

BY PATRICA KEEFE
and CHARLES VON SIMSON
CW STAFF

LAS VEGAS — The calm and optimism with which many major software developers publicly greeted the joint IBM/Microsoft Corp. announcement last week belied the hard feelings that they had displayed just the night before.

And the fact that many industry observers believe Microsoft emerged victorious in the heated battle between Windows and Presentation Manager camps may have played a major role in stoking the flames that had erupted at a closed-door meeting held Sunday prior to the official announcement (see story page 1).

"The public attitude that all this is great for everyone is a lot of PR," said one chief executive officer who, along with 80 other developers, attended the meeting called by IBM and Microsoft. "The lines were clearly drawn, and there were a lot of angry words. I wished I'd had a camera to record some of the faces."

At that briefing, James A. Cannavino, IBM vice-president and general manager, Personal Systems, and Microsoft Corp. Chairman Bill Gates detailed their plan to provide a smaller, consistent OS/2 to a sometimes-resistant group of key developers.

Heavy hitters

Attendees included Jim Manzi, chairman of Lotus Development Corp., Fred Gibbons, president of Software Publishing Corp., Ed Esber, chairman of Ashton Tate, Umang Gupta, founder of Gupta Technologies, Inc., J. Paul Grayson, chairman and CEO of Micrografx, Inc., and a representative from Oracle Corp.

As might be expected, emotions fell along the lines of development dollars, with heavy OS/2 investors such as Manzi and Esber expressing anger that IBM had endorsed Windows, and Windows supporters such as Gupta voicing concerns of their own about OS/2 encroachment on that segment.

Developers who attended the briefing reported heavy fireworks, mostly involving Gates, who reportedly was bombarded with complaints from four Presentation Manager developers. Manzi, Gibbons, Philippe Kahn of Borland International, Inc. and Gordon Eubanks, president of Symantec Corp., were the only vocal critics of the plan, said another developer who was there.

Manzi kept the fires burning well into the week by suggesting that Windows had been "neutered," given that Microsoft has agreed not to extend its capabilities with server support or the addition of advanced OS/2 features.

Lotus decided early on to bypass Windows for Presentation Manager and has accused Microsoft of jeopardizing Presentation Manager with its support for Windows.

Manzi further implied that Microsoft had been forced to scale back Windows 3.0's capabilities — a charge Microsoft officials hotly denied.

Ashton-Tate's Esber rips into developers

BY PATRICIA KEEFE
CW STAFF

LAS VEGAS — It's high time software developers told users that they can't have their cake and eat it too.

That's the gospel according to Ashton-Tate Corp. Chairman Ed Esber, who last week blasted the development community for not having the gumption to give users the straight dope on advanced technology requirements.

"Never before has the industry been so far ahead of itself," said Esber in an interview at Comdex/Fall '89. He was referring to applications developers who have tried unsuccessfully to cram in the added functionality requested by users under operating systems that cannot handle the load.

Esber knows only too well of what he speaks. AT's efforts to deliver a mother lode of advanced features within the 640K-byte barrier tripped up delivery of Dbase IV 1.1 [CW Aug. 21], contributing both to a stiff quarterly loss and layoffs. Esber has since split Version 1.1 into two — "vanilla" and server-editions.

Pounding his fist on the table for emphasis, Esber said developers have failed users by not giving it to them straight. Yet he did not absolve users, whom he said often ask for added features, such as improved ease of use, and expect the software to work within the 640K-byte limit of DOS.

Ashton-Tate's Esber

"We are victims of the success that made [personal computers] important to corporations," he said. These companies are now demanding commensurate capability with that level of importance, Esber said.

This demand has led to overlays, memory and DOS extensions, Esber said, citing Lotus Development Corp.'s 1-2-3. This catch-22 leads in turn to missed ship dates, buggy products and unhappy users.

"Instead of beating our chests Tarzan-like and giving it the old college try, we must say to customers that [X] features require this, and [Y] features require that," Esber said.

There is only so much developers can do with "standard editions," he said, in an apparent reference to MS-DOS. At some point, they, and users, have to accept the fact that they'll have to go to the "advanced edition" to get the functionality they want, Esber said.

Exacerbating the problem is the fact that product testing has not caught up with the increasing complexity of system software, Esber claimed, pointing to the massive amount of code that makes up many micro applications today. He predicted significant changes will have to take place in testing methodology.

At the same time, Esber acknowledged that the industry "constantly underestimates customer investment in [their installed systems]." Cost issues, including hardware and software upgrades, as well as training issues, all serve to keep users from migrating to newer systems, he said. In a telling comment from a software supplier, Esber added, "Let's face it, most users have overbought software." The average user uses only 20% to 30% of his software," he said.

New rules cramp start-up style

BY JAMES DALY
CW STAFF

LAS VEGAS — Would a pair of Steves named Jobs and Wozniak be able to sell a hot-wired, homegrown, radically different computer if they had put it on the market today instead of 13 years ago?

Probably not, said attendees at last week's Comdex/Fall '89, who agreed that the industry is now less hospitable to newcomers than ever before.

Upstart companies face a multitude of new challenges, including a crowded and cutthroat market, conservative investors looking for short-term payback and technically savvy users unwilling to settle for anything less than state of the art.

As a result, many start-up organizations concentrate on providing more easily produced incremental advances to existing products and have abandoned going for the technological home run — thus essentially serving as the research and development departments of large corporations.

"The game has changed radically," said John Landry, chairman of Agility Systems, Inc., a 2-month-old software house based in Wayland, Mass. "Newcomers are looking for marketing channels while the big guys need to keep producing innovative technologies. So we swap."

Newcomers hope that by providing an added value to existing standards, they may develop a lucrative niche market and draw the attention of the larger firms. "Getting bought is typically in the mind of most people who start a company these days," Landry said.

The blue-sky developments are still possible but sometimes difficult without the backing of an industry heavyweight. The

Next, Inc. machine, for instance, incorporates a handful of ground-breaking new technologies but benefits from both the big bucks of Apple co-founder Steve Jobs and a $100 million check from Canon, Inc.

Likewise, Poqet Computer Corp., which boasts a 1-pound computer the size of a videocassette and uses less power than a twinkling Christmas-tree light, is 38% owned by Fujitsu Ltd.

"The focus these days is short-term; if you're out of cash, you're out of business," said Stav Prodromou, president of the Sunnyvale, Calif., company.

Increasingly demanding users are also intolerant of what appear to be cheapjack solutions. Sophisticated manufacturing and distribution methods are costly and are often beyond the reach of all but the most well-financed ventures, most observers said.

As a result, the cost of starting a firm has skyrocketed into orbit during the last 10 years. According to the American Electronics Association, the minimum investment needed to fund a new company even as recently as 1980 was around $250,000; today it is more than $4 million.

And that capital has become harder to come by. Venture capitalists are very conservative.

"A newly started company, which does not yet have receivables, can be very tough to finance," said Donald S. Cvietusa, who works as a liaison with Northern California venture capital firms as vice-president of the Silicon Valley Bank in Santa Clara, Calif.

Bankers have instead put their money toward companies with something already on their shelf, especially newly formed retailers, distributors and value-added resellers. As a result, new companies often rely on individual, rather than institutional, sources of funds.

PC-based mini rival flaunts its MIPS

BY CHARLES VON SIMSON
CW STAFF

LAS VEGAS — In a town that has inspired bravado in heavyweight champs and two-bit hustlers, claims that yet another personal computer-based system was gearing up to challenge minicomputers raised few eyebrows last week.

However, a joint announcement by The Santa Cruz Operation (SCO) and Corollary, Inc. appears to position a multiprocessor version of SCO Xenix to challenge departmental systems. The multiprocessor extension to the SCO Unix-based system will allow for the use of up to seven 80386- and 80486-based CPUs in a single scalable system, offering a theoretical speed approaching 100 million instructions per second. The extension was developed by Corollary, an Irvine, Calif.-based company, and is scheduled for a first-quarter 1990 release.

A number of software and hardware vendors endorsed the new product. Oracle Corp., Compaq Computer Corp., Informix Corp. and Sybase, Inc. all announced that they would either run the software on their platforms or write applications to the system software.

"It is uncertain that anyone can actually attain the extreme ends of performance in a business environment, but it is clear that this machine can run head-to-head with departmental VAXs," said Neal Nelson, president of Neal Nelson & Associates, a benchmark specialist in Chicago, who tested the machine.

Nelson has issued an open call to provide free benchmark testing of the SCO server on business applications volunteered by users. "It is clear that the system represents a fivefold improvement in standard price/performance and will further accelerate the migration of minicomputer applications to PC platforms," he said.

SCO is claiming that by using the system, developers can now assemble PC-based servers, workstations or departmental computers capable of outrunning any computer based on either reduced instruction set computing microprocessors or proprietary CPUs.

REPORTER'S NOTEBOOK

Expo, schmexpo, but how do they tip?

The Macintosh may be the greatest thing since the automated teller, but it's not the last card up **Apple's** sleeve. "The Mac is not the last product line from Apple, I can tell you that," said Chris Espinosa, Apple's systems software product marketing manager.

Microsoft is set to announce the industry's first site-licensing program for network software. Application Division chief Mike Maples said the industry has got to figure out a way to charge for network software, and that this would be a strong beginning. The finishing touches are being put on the plan, which will be announced by the end of the year. "Most customers want to pay fairly, but they want to know exactly what the parameters are," Maples said. "We are hoping that a pricing contract will become an industry standard." Maples declined to comment on specifics.

Enzo Torresi, co-founder of **Businessland** and current president of **Netframe**, on the unspecified time frame for the convergence of **IBM's** LAN Server and **Microsoft's** LAN Manager products: "One thing I have learned in this business; Bill Gates — no dates."

Still grumbling about **Apple's** flimsy 90-day product warranty? Help may be on the way. Apple execs said they are taking a second look at the guarantee to see if they can beef it up. Keep your fingers crossed.

Winner of the Most Hyped Product Award: Wiz, a mouse and pad combo offered by Lockheed subsidiary **Calcomp.** Ads for the little critter were on the backs of cabs, the weekly guide to Las Vegas and seemingly everywhere in the convention hall. At least the craps tables were safe.

Security guards at the Las Vegas airport seemed on the verge of tears as they opened and tested the thousands of laptops toted by Comdex attendees. "I hope I never see another one of you computer guys," one guard complained as he turned on yet another PC.

Comdex may be the official meeting of the tribes for the computer community, but not everyone considers the show de rigueur. Among the missing in action: **Sun Microsystems, DEC, Silicon Graphics and 3Com.**

A few no-shows didn't stop Comdex founder **Sheldon Adelson** from unveiling plans for a 500,000-square-foot exposition and convention center at the Sands. The center will be open for next fall's Comdex and will provide more than 20,000 hotel rooms less than 10 minutes from the show's front door.

Intel's advertising campaign showing a red X drawn through the number 80286 is not an attempt to scare people away from the successful 80286-based systems, according to Dennis Carter, program director of microcomputer marketing for Intel and the executive in charge of the campaign.

With many in the industry either skeptical of that claim or bemused by the effort to create a mass-market understanding of semiconductor architectural distinctions, Carter professed that Intel is merely trying to drive home to computer users the company's belief that the 16-bit 80386SX chip will be viable well into the next decade.

"People's perception of the 386 is that it is for power users, for the high end — and people disqualify themselves from those categories," Carter said. "They don't understand that decision is going to lock them out."

Carter said the 486 chip won't reach its peak until midway through the '90s, which, he said, makes 386 chips useful for much of that decade because software written for the 486 will be backward-compatible with the 386 chips.

Computer people are so-so tippers, according to a less-than-scientific survey of **Las Vegas cab drivers.** The final verdict — "Better than the heart doctors, but not even close to the Teamsters," said one Vegas hack.

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January of 1989 by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
Copyright 1988 by CW Publishing/Inc. All rights reserved.
Computerworld can be purchased on 35 mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. *Computerworld* is indexed: back issues, if available, may be purchased at $2.00 per issue, plus postage. Call (800) 669-1002.
Photocopy rights: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Publishing/Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, MA 01970.
Reprints (minimum 500 copies) and permission to reprint may be purchased from Sharon Bryant, CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Subscriptions call toll free (800) 669-1002.
Requests for missing issues will be honored only if received within 60 days of issue date.
Subscription rates: $2.00 a copy: U.S. — $48 a year; Canada — $110 a year; Central & So. America — $130 (surface), $250.00 (airmail) a year; Europe — $195 a year; all other countries — $295 a year. Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin.

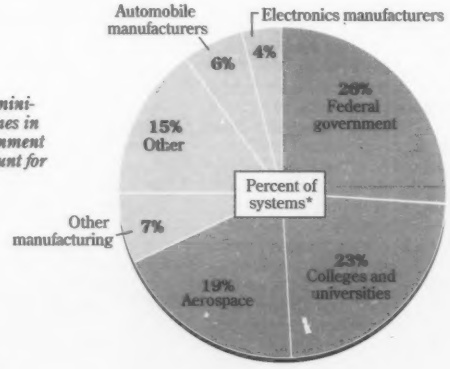
MPA ABC ABP BPA

POSTMASTER: Send Form 3579 (Change of Address) to *Computerworld*, P.O. Box 2044, Marion, OH 43305.

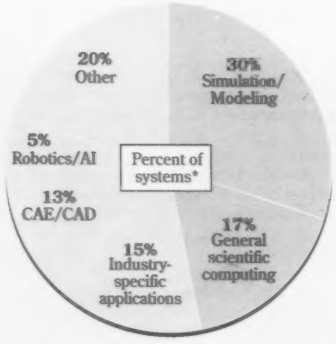
TRENDS

Minisupercomputers

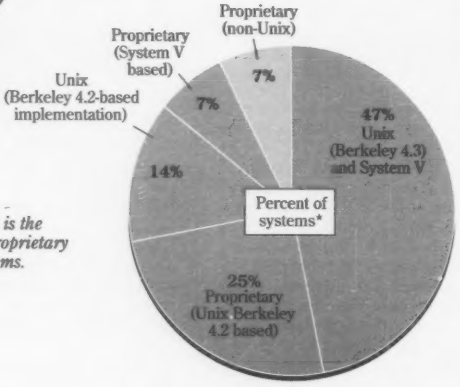
Minisupercomputers generally offer between 50 and 200 MFLOPS of computing power, with prices ranging from $100,000 to $1 million. The allure of this breed of high-performance computing is that it offers 25% of the performance of supercomputers at 10% of the price.



Minisuper users by industry
Like their supercomputer counterparts, minisupercomputers find the warmest welcomes in the aerospace industry, the federal government and universities, which combine to account for 68% of the installed base.



Applications running on minisupers
Simulation and modeling are the most widely used, followed by general scientific computing.



Minisuper operating systems
Helping the proliferation of minisupers is the choice of operating system. Unix and proprietary derivatives are used on 93% of the systems.

*Based on estimated cumulative system shipments

SOURCE: ELECTRONIC TREND PUBLICATIONS, SARATOGA, CALIF.

CW CHARTS: FRANK C. O'CONNELL

NEXT WEEK

Warner Communications, Inc.'s Don Winski has done career turns as a chemical engineer, systems consultant and chief executive officer. Now he is running the computer and telecommunications show at the home of *Batman* and Tracy Chapman — and having fun doing it. A profile of Winski appears in Manager's Journal.

ANDY FREEBERG

The analog modem may be slated for extinction with the arrival of digital models, but the high-speed segment of the market is currently in flower, thanks in part to the advent of the V.32 standard. Multiplexers stand to become more central with new service options. Product Spotlight examines what the categories have to offer prospective purchasers.

INSIDE LINES

Memory and ivory

It was a thriller for Comdex/Fall '89 attendees tired of staring at keyboards and blue-suited hucksters. Megastar Michael Jackson made an impromptu visit to the Las Vegas computer exhibition last week, and the biggest story was that hardly anyone in the crowd of 120,000 even knew he was there. Jackson stopped by the Roland booth to schmooze with company President Thomas Beckmen and try out some new products. The visit was unannounced, and since the Roland booth was far away from the heavyweights, just a few lucky showgoers caught a glimpse of the great gloved one. According to Beckmen, Jackson uses a lot of Roland equipment (the company makes synthesizers and PC-based music systems).

Not another standard!

Reportedly it's news to IBM, but Patrick Courtin, president of Proteon, a developer of Token-Ring network adapters for both IBM's MCA and the rival EISA bus, said he has encountered "significantly different implementations of what MCA is" between the Personal System/2 Model 50 and Model 70. He outlined a case involving timing differentials between the two models that forced him to make an adjustment to his card. Courtin also complained that IBM's decision to go with a smaller board forces him to "play games" with his board design. Generally speaking, he said the MCA standard is not as clearly defined as the EISA standard.

Don't like it like DAT

Palindrome's initial investigation of digital audio tape as a backup medium has unearthed some problems with this state-of-the-art technology. Among the problems encountered were no error-correction code and no verify-read-after-write. Palindrome also questioned DAT's pricing: 2G-byte 8mm drives cost only about $1,000 more than a 1G-byte 4mm DAT drive. As a result, Palindrome is delaying release of its first DAT product until second-generation DAT technology arrives early next year.

Storm windows

Lotus attempted to manipulate public support away from Windows by leaking information about a scaled-down version of Presentation Manager that would run under DOS. But that strategy has actually backfired, in the opinion of some industry observers. IBM received so much negative industry reaction over PM Lite that it hurt its negotiating position with Microsoft, according to J. Paul Grayson, president of Micrografx.

Small firm, big heart

Nearly lost in the circus of glee clubs, raffles, foam footballs, mock wedding ceremonies and Elvis impersonators (one of whom sang "Hard-Disk Hotel") at last week's Comdex in Las Vegas was a quieter vendor incentive. Sitback Technologies, in Overland Park, Kan., told visitors to its booth that it would donate 10% of sales from its $99 PC backup utility and diskettes to the Red Cross Earthquake Fund.

Dark days at Datapoint

As if it needed more troubles, Datapoint reportedly went through a layoff last week. Details are sketchy at this point, but a significant Datapoint customer said the company's Dallas office is down to a skeletal staff. There was no answer at the office on Friday, and the answering service said the receptionists have quit. Datapoint does most of its business overseas, and there's been speculation recentiy that it would close its U.S. operations.

Here's one award that wasn't handed out at Comdex/Fall '89, so we'll do it ourselves. The award for Most Sexist and/or Tackiest Gimmick must surely go to Fujitsu, which featured a "slave auction of women" at its shindig. Scantily dressed women were hauled "screaming" into the party, where they were to be autioned off. Once sold, they were tossed over the shoulders of whip-bearing males who bore them off. It's not everyday that a vendor goes out of its way to demean half of its customer base. If you have any tips to share about vendors, whether they live in the 20th century or not, call Assistant News Editor Jim Connolly at 800-343-6474 or 508-879-0700.

The CFO says it better save money.
The CEO says it better be right.
And you've got a few priorities of your own.

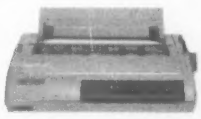
There are pressures and then there are pressures. Choosing a computer company has to rank high on the list.

But there are ways to deal with the pressure. And ways to make sure that both your CFO and CEO are very happy indeed.

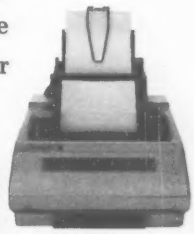
That's where NEC comes in. We make a full line of high quality, industry-standard personal computers known as The PowerMate® Family. Portables or desktops, 286-based or 386-based, they give you the kind of speed, memory and graphics capabilities you need to tough it out in today's business environment. We also make a full line of printers. Pinwriter® dot matrix printers and Silentwriter® laser-quality page printers. Now if the phrase "legendary reliability and superior print quality" comes into mind, we're not all that surprised.

PowerMate SX Plus

PowerMate Portable Plus



Pinwriter P5300



Silentwriter LC 890XL

One more thing: NEC is a $24 billion world leader in computers and communications. And just knowing that can have a remarkable effect on one's blood pressure.

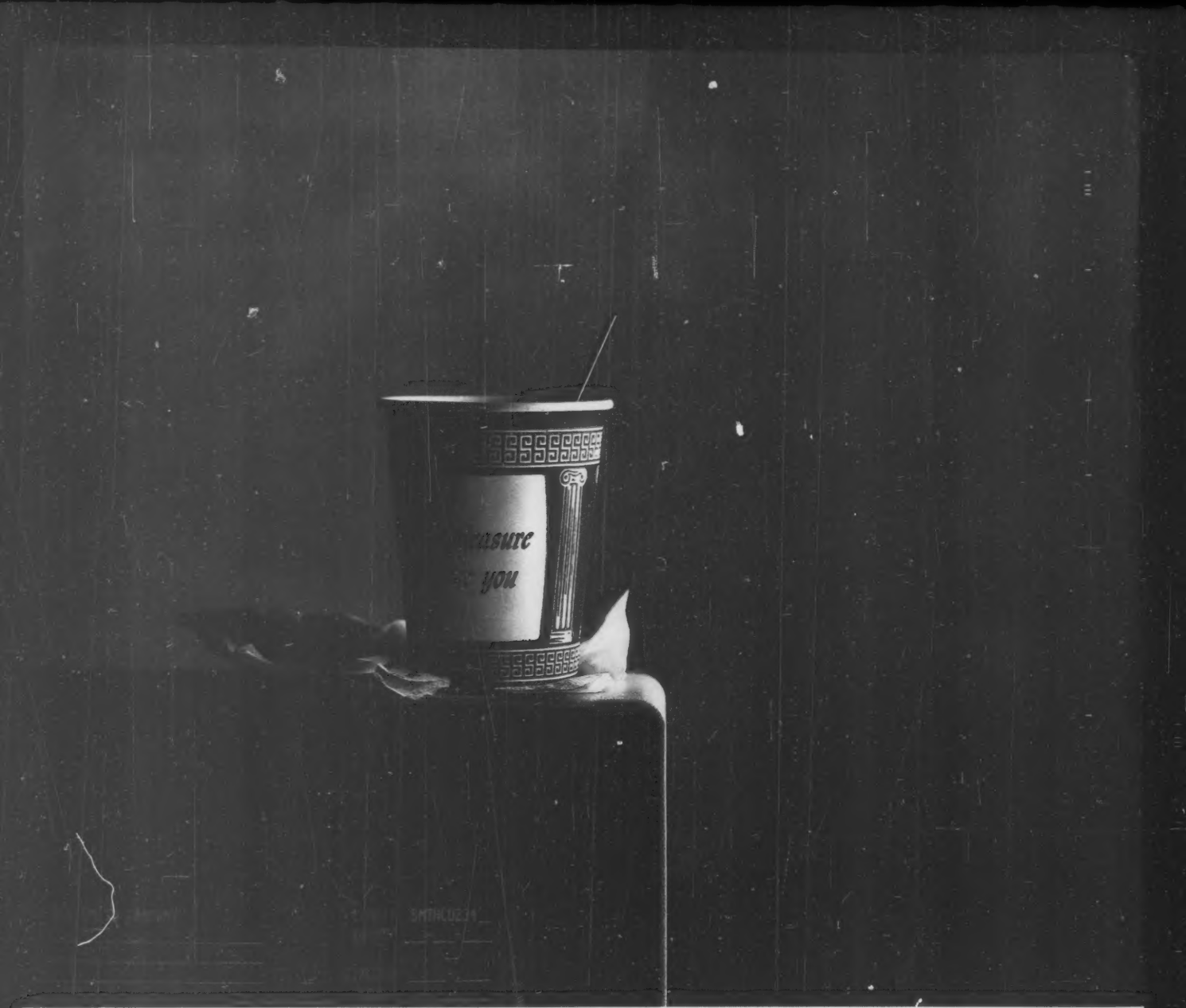
NEC

WE'RE MAKING THINGS BETTER FOR YOU.

NEC Technologies, Inc., 1414 Massachusetts Ave., Boxborough, MA 01719. 1-800-NEC-INFO. In Canada, 1-800-343-4418.

C&C Computers and Communications

© Copyright 1989 NEC Technologies, Inc. PowerMate, Pinwriter and Silentwriter are registered trademarks of NEC Corp.



The way most computers are used is an insult to their intelligence.

Your brilliant computer may be dumber than you think.

The sad fact is, while thousands of businesses have hooked up personal computers to mainframes, the majority of those computers are used as "dumb terminals," leaving a vast potential untapped.

For MSA, the intelligent workstation is a promise that should be kept, which is why we are proud to introduce BrightView™ applications software.

By harnessing the power of cooperative processing, BrightView enables the intelligent workstation to perform tasks previously restricted to the mainframe. This revolutionizes the efficiency of your entire computer system, meaning each component can now do what it does best, with valuable mainframe resources freed up for more appropriate tasks.

What's more, MSA is the first company committed to delivering the most extensive line of SAA-compliant software in the industry, and BrightView is already in compliance with SAA's most advanced component, Common User Access. It yields a friendly, consistent look and feel to workstations, helping maximize your investment in both personnel and hardware.

Whatever your software applications needs are, it might be wise to call Robert Carpenter at 404-239-2000. In fact, it's really the only intelligent thing to do.

MSA
The Software Company®

© 1989 Management Science America, Inc. (MSA)
MSA—The Software Company & BrightView are trademarks of Management Science America, Inc.